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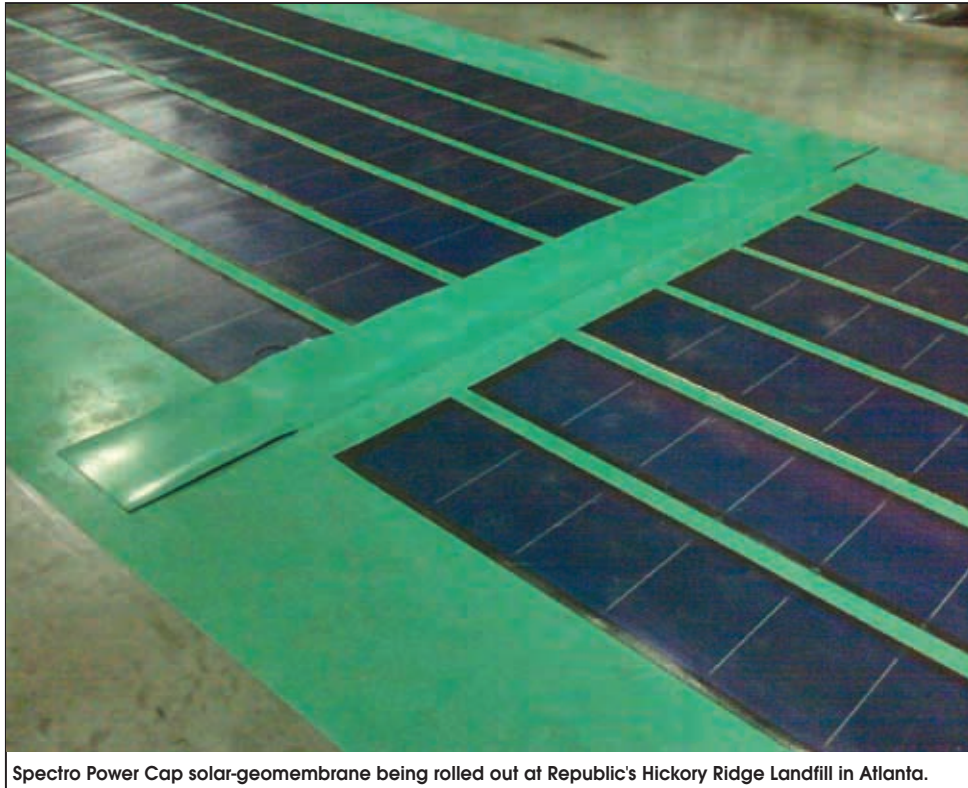
NewsVoice of Salvage, Waste and Recycling

AmericanRecycler.com

Bright idea – solar power over landfills

by MIKE BRESLIN

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Spectro Power Cap solar-geomembrane being rolled out at Republic's Hickory Ridge Landfill in Atlanta.

Last year the United States Environmental Protection Agency (EPA) and the Department of Energy's National Renewable Energy Laboratory announced that they are evaluating the feasibility of developing renewable energy production on superfund, brown-field, and former landfill or mining sites. They identified more than 11,000 sites that are good for renewable energy.

While the federal government evaluates, private investors, private and public landfill owners are on the prowl to generate more income or reduce expenses on their vast expanses of denuded real estate. Putting photovoltaic cells (PV) on closed landfills, whether in the form of flexible solar-geomembrane technology or conventional panel arrays, is beginning to emerge as a practical solution.

Today, there are fewer than 10 solar installations on United States landfills – a mix of flexible membrane covers utilizing thin-film PV cells and more traditional glass-faced panels. Most are considered in the demonstration phase, but Republic Services, one of the country's largest solid waste handling companies, has gone beyond the pilot stage and is currently installing a one megawatt solar-geomembrane system in Atlanta, Georgia.

Meanwhile, environmentally progressive states like Massachusetts are

beginning to issue permits for solar projects on closed landfills. Some are already starting construction.

The logic of installing solar arrays on closed landfills is compelling. A September, 2009 study commissioned by the EPA entitled Solar Power Installations on Closed Landfills: Technical and Regulatory Considerations illuminated the potential, "Since 1988 the number of municipal solid waste (MSW) landfills

in the United States has decreased from 7,924 to 1,754. Accordingly, at least 6,170 landfills have closed over the past 2 decades. Estimates for the total number of closed landfills in the United States are as high as 100,000. This roughly estimated number of landfills represents hundreds of thousands of acres of real property."

Accordingly, the EPA is encouraging the reuse of contaminated lands,

including properties with closed landfills to site clean, renewable energy projects. Through the Re-Powering America's Lands Initiative, EPA's Office of Solid Waste and Emergency Response (OSWER) has identified several important reasons for siting renewable energy facilities on contaminated lands such as landfills, including:

- Thousands of acres of open space in areas where solar installations may be less likely to involve community concerns over aesthetics.
- Lower transaction costs compared to greenfield real estate.
- Contaminated lands have environmental conditions not well suited for commercial or residential zoning and are in low demand by real estate developers.
- Electricity generated from renewable energy projects on contaminated or remediated lands can be used onsite or sold or credited for offsite use.

Naturally, doing anything new at landfills is fraught with engineering, permitting, regulatory and construction obstacles.

Nevertheless, with leadership provided by MassDEP, Borrego Solar, a private developer of commercial solar projects, has signed a contract with the City of Easthampton to build a 2.3 megawatt DC solar plant on the city's closed 12 acre landfill. Under a 10 year Utility Credit Purchase Agreement

See BRIGHT IDEA, Page 6

Michigan Senator proposes a fee on Canadian trash

United States Senator Debbie Stabenow (D-MI) introduced legislation called the "Stop Canadian Trash Act," which proposes a \$500 fee for every truck hauling waste into the United States.

Carlton Farms in Wayne County, Pine Tree Acres in Macomb County, and Brent Run in Genesee County account for 90 percent of Canadian waste being dumped in the state, according to the Department of Michigan Environmental Quality.

"Senator Levin and I were able to stop Ontario's city waste from being

dumped in our backyard, but now it's time to stop the rest of the trash coming across the border. My legislation, the Stop Canadian Trash Act, will end the financial incentive that makes it cheaper for Canadian companies to dump their trash in Michigan landfills and make sure Homeland Security has the ability to inspect every single trash truck at the border," said Stabenow.

Stabenow and others argue that Michigan receives more than its share of

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Geothermal energy is picking up steam



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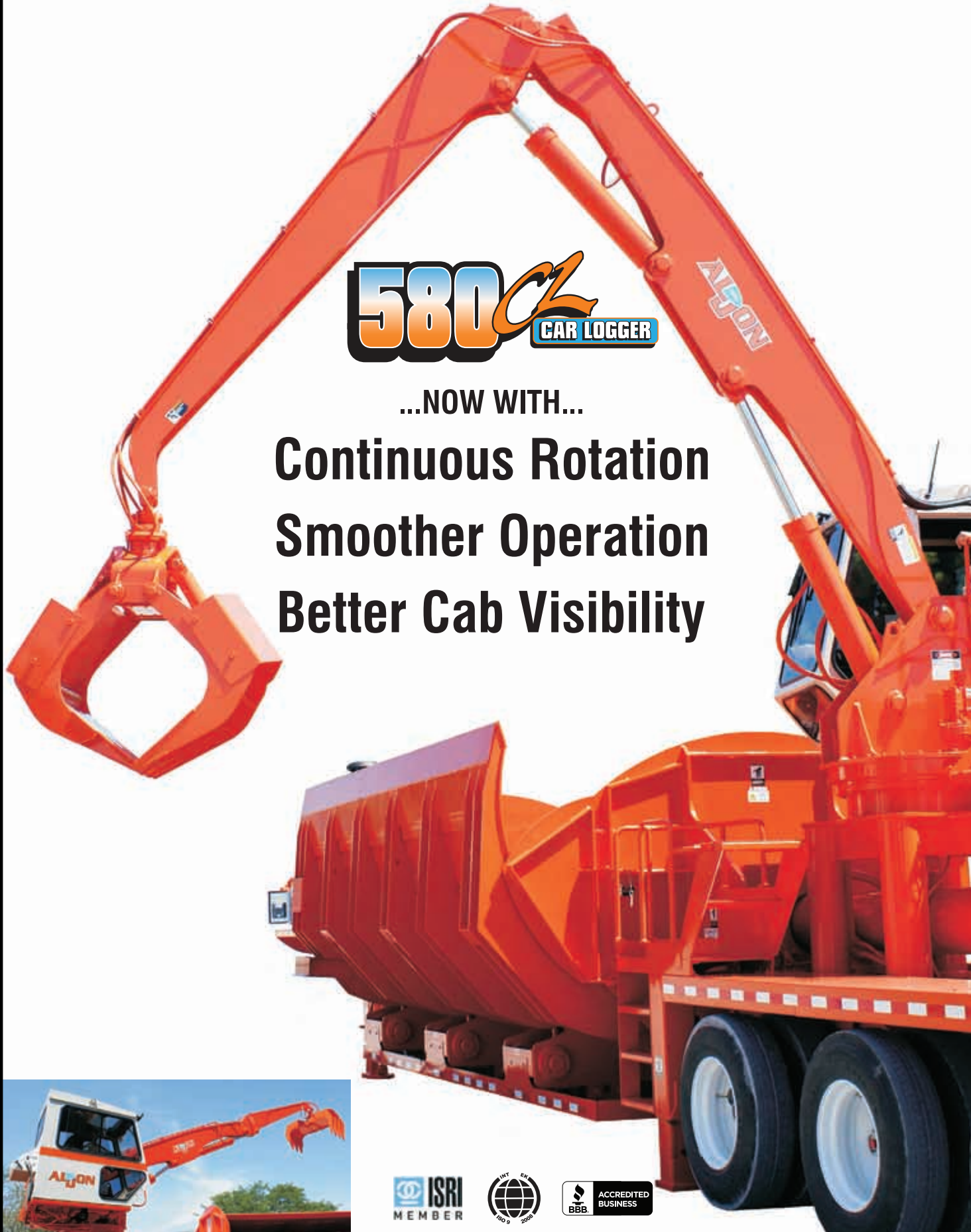
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The story of recycling told



Robert Bylone, Executive Director of the Pennsylvania Recycling Markets Center (RMC), and Tim O'Donnell, President of the Pennsylvania Waste Industries Association (PWIA), display Citations received from Philadelphia's Mayor Michael Nutter and the Philadelphia City Council in honor of the Philadelphia Recycling Industries Congress.

PWIA and the RMC jointly sponsored the Philadelphia Recycling Industries Congress in April in City Hall.

PWIA represents the supply side of the industry – the larger companies in the waste industry that collect and process recyclables and are investing heavily in new facilities and technologies. For example, Waste Management and Republic Services, both national companies with a strong presence throughout Pennsylvania, attended the Philadelphia Congress on behalf of PWIA.

The RMC works more so with the demand side – companies that use recycled materials and seek to expand markets for products made from recycled materials. Among the companies the RMC invited to the congress were Re Community, a materials recovery facility; Kuusakoski Philadelphia and Eforce Compliance, both electronics scrap processors; Revolution Recovery, a demolition waste management and recycling company; and Two Particular Acres, a producer of organic compost and mulch.

“Recycling was once considered the province mainly of environmentalists. Now, however, the private sector is driving growth,” said Tim O'Donnell, president of the PWIA. “With the recent addition of a Waste Management single-stream recycling plant that just opened in Philadelphia, private companies have now invested more than \$87 million in new recycling facilities and technologies in Pennsylvania in just the last several years.”

“Meanwhile,” Robert Bylone of PWIA said, “the number of companies finding new uses for recycled materials is rapidly expanding and driving job growth not only in Philadelphia but also statewide.”

The Philadelphia recycling congress was a spinoff of the first-ever Pennsylvania Recycling Industries Congress, held in the Capitol in Harrisburg.

According to a PWIA study, the private-sector waste industry contributes \$3 billion a year to the Pennsylvania economy and accounts for 31,500 jobs. A study by the Northeast Recycling Council found that 3,800 establishments in Pennsylvania connected to recycling or reuse and remanufacturing generated 52,316 jobs with an annual payroll of \$2.2 billion.

RecycleMania recycles 90 million pounds

RecycleMania wrapped up its 11th annual recycling competition in early April. RecycleMania is an eight week challenge that ignites classic college rivalries, rallying students, faculty and staff to increase on-campus recycling rates beyond their collegiate competitors.

This year, 91 million pounds of recyclables and organic materials were recovered, which prevented the release of nearly 270 million metric tons of carbon dioxide equivalent.

The competition, which extended from February 6 through April 2, includes eight categories. The colleges and universities that took home top prizes in the three primary categories are:

- Grand Champion – (determined by the percentage of overall waste recycled): California State University-San Marcos (79.69 percent) – San Marcos, California.
- Per Capita Classic – (determined by total pounds of recyclables collected per person): Union College (55.69 pounds) – Schenectady, New York.
- Waste Minimization – (determined by the lowest overall amount of waste recyclables and trash per person): North Lake College (3.07 pounds) – Irving, Texas.

RecycleMania is an independent program of the RecycleMania Steering Committee. The competition is made possible with the sponsorship support of SCA Tissue, The Coca-Cola Company, Alcoa Foundation, Waste Management, Keep America Beautiful and the American Forest & Paper Association. Program management is provided by Keep America Beautiful with additional program support from the United States EPA's WasteWise program and the College and University Recycling Coalition.

Top schools in each category earn "bragging rights," while the winners of each are recognized with an award made of recycled glass.

For the full results of the competition, view this article on www.americanrecycler.com.

RailAmerica reports March 2011 carloads

RailAmerica, Inc. reported that its total freight carloads for the month ended March 31, 2011 were 76,732, up 0.9 percent from 76,045 in March 2010.

RailAmerica had increased shipments in March 2011 in 7 out of 12 commodity groups compared to March 2010.

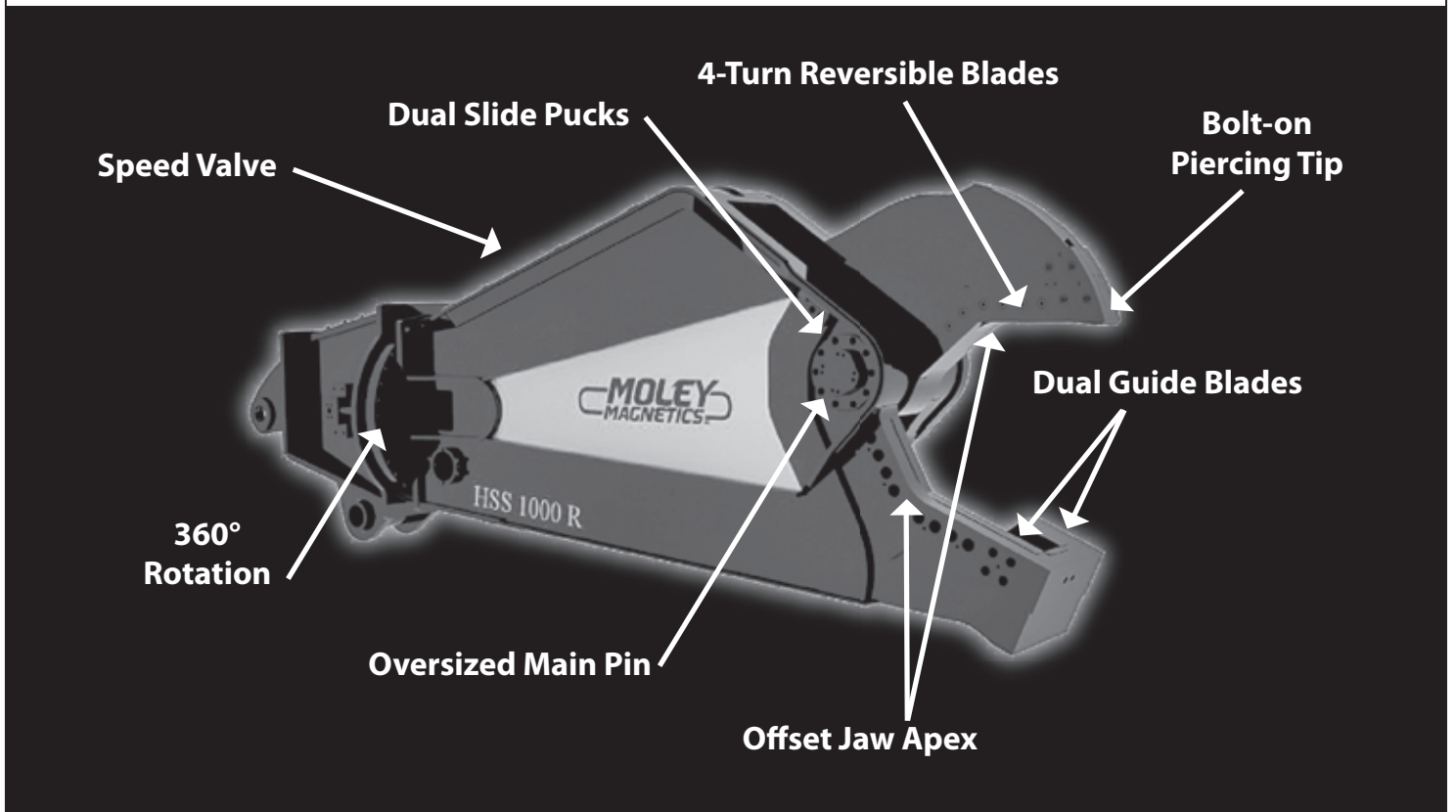
Much of the increase was due to shipments of non-metallic minerals and products and waste and scrap materials. Waste and scrap materials volumes were up primarily in the Southeast and West regions. The largest declines were in agricultural products and other.

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Sustainability awards bestowed

David Chavern, United States Chamber executive vice president and chief operating officer, and Alison Taylor, Siemens Corporation vice president of sustainability, presented local leaders from San Jose, California; Raleigh, North Carolina; and Greensburg, Kansas with Sustainable Community Award trophies. Nearly 90 different communities from 40 states applied for the award.

In the category of large community, San Jose, California, won the 2011 Siemens Sustainable Community Award for its adoption of Green Vision, a 10-point roadmap for innovation and environmental responsibility that serves to strengthen economic opportunity and prosperity. With \$4 billion in venture capital funding for clean technology and a goal of creating 25,000 clean tech jobs – of which, more than 4,000 have been created since 2007 – San Jose shows how environmental innovation and economic opportunity can go hand in hand.

In the midsize community category, Raleigh, North Carolina, won the award for a range of factors including its commitment to developing a “green economy.” The city established the Economic Development Group, comprising government agencies, businesses and community organizations to help make sustainability-

based jobs more available to residents. Raleigh created a workforce development program to retrain workers with green skills, training more than 200 people in the first year. Additionally, Raleigh is home to one of the nation’s two LEED Silver convention centers, attracting substantial economic activity that bolsters the entire community.

The winner of the small community category, Greensburg, Kansas, overcame challenging odds to become one of the world’s first municipalities to build from the ground up with a community master plan tied to sustainability principles. In May 2007, Greensburg, a two mile-wide town, captured headlines when it was leveled by an EF-5 tornado. Its commitment to rebuilding and reinventing itself through sustainable living and a healthy environment is at the heart of the town’s recovery from the disaster. Greensburg has achieved the most LEED-platinum buildings per capita in the world. To date, more than 60 local businesses have re-opened or are in the process. “The Greensburg Model” has led to new tourism opportunities, as people travel from across the world to experience the town’s green rebuilding projects.

Other finalists in the large, midsize, and small categories in the 2011 competition included: Baltimore, Maryland; Columbus, Ohio; North Little Rock, Arkansas; Pittsburgh, Pennsylvania; Brea, California; and Burlington, Vermont. A panel of five judges selected the finalists and winners based on the communities’ approach to achieving economic, environmental and overarching sustainability.

Solarsilicon to increase outlets and workforce

Solarsilicon Recycling Services LLC (SRS) has acquired a 90,000 sq. ft. building in Ventura, California in an expansion that will open new outlets for its products and services, increase its workforce and establish an incubator for a new manufacturing process that promises to revolutionize the industry.

SRS, which recycles unusable and off-spec silicon and processes it into usable feedstock for the solar industry, acquired the property for \$6.3 million.

Since March the company has grown from 43 employees to 70 workers and SRS has been operating its 20,000 sq. ft. Camarillo facility on a 24 hour, 6 day-per-week schedule to meet the demand for its products since September.

SRS also needed a larger facility to continue work it has begun on the development of a second process for cleaning silicon that will be unique to the industry and is expected to revolutionize the silicon manufacturing process. The Ventura facility will be an incubator for this new process, and, once operational, it will become a flagship for the company’s expansion throughout the Pacific Northwest, Midwest and even Europe.

Short term, SRS will hire an additional 20 to 30 new workers and will invest up to \$5 million in new equipment to enable cleaning silicon to semiconductor standards and open up a new channel of distribution for its products.

Trash fee

Continued from Page 1

waste because it is cheap relative to other states in the region.

Michigan charges \$.21 per ton compared to Illinois which charges \$2.22 per ton, Iowa’s fee ranges from \$3.25 to \$4.75 and Wisconsin charges nearly \$13 per ton. More than 46 million cubic yards of waste were deposited in Michigan landfills in 2010, with nearly 8.8 million cubic yards from Canada, according to a report from the Michigan Department of Environmental Quality. That number is down from 9 million yards in 2009 and 10.7 million yards in 2008 in part due to the economic downturn but also due to a deal Sen. Stabenow and fellow Sen. Carl Levin (D-MI) brokered in 2006 with officials in Ontario to voluntarily reduce waste exports to Michigan.

The Stop Canadian Trash Act will require Canadian companies shipping waste to the United States to pay a \$500 user fee at the border to provide the Department of Homeland Security with the resources to inspect every trash truck. The fee will be assessed on international trash trucks carrying foreign trash handled or collected by any means from residential, commercial, and indus-

trial sources. Right now, international trash trucks generally pay \$5 to haul waste into the United States and only one percent are randomly screened by U.S. Customs and Border Protection.

Sen. Stabenow now argues that it is an issue of national security and points out that only one percent of international waste trucks are screened for radiation. The new law would require all trucks be inspected and impose a \$10,000 penalty each time an importer failed to provide to the U.S. Customs and Border Protection information relating to the volume and contents of each truck.

Not only will the legislation help stop Canadian trash from being dumped in Michigan, it will make the State’s border more secure. A 2006 Department of Homeland Security Report found that because so few trucks are thoroughly inspected, dangerous and/or illegal materials can be carried across the border undetected. In fact, the report discusses one instance in 2004 where 1,900 pounds of marijuana were found in the back of a trash truck after the truck received a more thorough inspection. Sen. Stabenow’s bill will help address this issue by making sure the Department of Homeland Security has the resources it needs to ensure that trash trucks are not bringing dangerous and illegal materials into Michigan.



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ISRI releases 2010 scrap recycling industry facts

Scrap recycling earnings up 40 percent

The Institute of Scrap Recycling Industries, Inc. (ISRI), released 2010 scrap recycling industry facts and market trends that show a thriving industry that has grown 40 percent since 2009 in terms of monetary value – despite the lingering effects of the global recession.

In releasing the statistics, ISRI president Robin Wiener noted that recycling goes far beyond the bin at the edge of the curb. In fact, in 2010 alone, more than 130 million metric tons of scrap metal, paper, plastic, glass, textiles, rubber and electronics, valued at more than \$77 billion, were manufactured into specification grade commodities by the scrap recycling industry in the United States for sale as valuable feedstock material to industrial consumers in the United States and in more than 155 countries around the world. These recycled commodities:

- Strengthen the economy.
- Create thousands of new jobs as even more recycled materials are used in the manufacture of new products and more equipment to enable greater recycling is built.
- Protect the environment by reducing air and water pollution as well as greenhouse gas emissions.
- Save energy by significantly decreasing the amount of energy needed to manu-

facture the products that we buy, build and use.

•Contribute nearly \$30 billion in export sales, significantly helping the United States trade balance.

ISRI detailed the volume of scrap recycling material annually processed by commodity from 2009 to 2010 (note some years are differentiated):

Volume of scrap material processed annually:

- Iron and Steel – up to 74,000,000 from 70,000,000.
- Paper – up to 46,800,000 from 45,400,000.
- Aluminum – down to 4,600,000 from 4,700,000.
- Copper – up to 1,900,000 from 1,700,000.
- Lead – down to 1,200,000 from 1,300,000.
- Zinc – up to 160,000 from 150,000.
- Plastic (bottles) – up to 654,220 (2009) from 658,390 (2008).
- Electronics – up to 3,500,000 from 1,800,000.
- Tires (number of tires) – up to 90,000,000 from 80,000,000.

ISRI's Wiener said, "The facts speak for themselves. Recycling is going strong and going green – no question about it."

IESI Missouri headquarters in Missouri now LEED certified



IESI Corporation's new Missouri headquarters was recently named the first waste hauling facility in Missouri to achieve Leadership in Energy and Environmental Design (LEED) certification from the U.S. Green Building Council.

Built using tilt-up techniques and steel, the facility incorporates many environmentally-friendly features such as water-efficient landscaping and plumbing systems; significant window use and skylight use to facilitate as much natural lighting as possible; low-volatile organic compounds (VOC) interior finish materials, including carpets, adhesives, and paints; elements encouraging the use of alternative transportation, such as bicycles or hybrid vehicles; and methods to reduce the heat island effect, including construction of a white roof.

With two 550 gallon oil tanks inside the shop and one 2,000 gallon storage tank outside the shop, IESI anticipates the system will save an estimated \$3,000 annually on heating bills, and approximately 3,600-5,000 gallons of used oil will be recycled annually in the process.

With a large amount of construction materials regionally sourced, IESI significantly reduced hauling transportation impact and pollution. Regionally sourced materials also provided an economic benefit to the St. Louis area. Furthermore, the project re-purposed and diverted a significant amount of generated construction waste away from area landfills.

The 17,200 sq. ft. building includes office space, 3 drive-through fleet service bays and a drive-through fleet wash bay.



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The Carpet Recyclers hit 100 million pounds mark



Over 4 billion pounds of carpet is disposed of annually in United States, wasting over 9 million barrels of reusable oil.

The Carpet Recyclers, operators of a carpet recycling facility in La Mirada, California, have collected and recycled 100 million pounds of post-consumer carpet since beginning operations in 2009. As carpet is a petroleum-based product, in addition to diverting this waste from landfills, The Carpet Recyclers' efforts have also kept 95,000 metric tons of greenhouse gases out of the atmosphere and saved 9.8 million gallons of oil that was reused to make products ranging from recycled carpet, building materials and cylinder head covers for the Ford Mustang.

On track to recycle over 60 million pounds of carpet in 2011, The Carpet Recyclers have already created 60 new green jobs in California and expect that number to increase to 150 by the end of the year in their efforts to gear up for AB 2398, the new California Carpet Stewardship law. The Carpet Recyclers is also increasing production in its zero-waste-to-

landfill facility, exclusive to the western United States, expanding transportation services and developing an innovative, state-wide network of post-consumer carpet collection centers to meet the rapidly-increasing demands for carpet recycling and the oil-based resources harvested by carpet recycling.

To encourage carpet recycling, starting July 1, 2011, AB 2398 requires a \$.05 carpet stewardship assessment to be placed on every square yard of carpet sold in California. The assessment must be shown on invoices to increase consumer awareness.

Carpet America Recovery Effort (CARE) has been designated as the industry stewardship organization charged with implementing AB 2398 goals. Their efforts include conducting educational programs and preparing communications materials for retailers and informational flyers for consumers which will be available in stores before July 1.

Bright idea

■Continued from Page 1

(UCPA) with East Hampton, Borrego will design, build and maintain the system that will produce approximately 2,774,823 kilowatt hours of electricity per year. The in-house financing arm of Borrego, Green Lake Capital, is handling the UCPA with the city.

"Easthampton is the only landfill project involving a signed contract. This project is in the design and permitting phase and will begin construction this summer," said Joe Harrison, Borrego's project developer. "We have also been awarded contracts for other Massachusetts solar projects on landfills in Lancaster, Dartmouth, Kingston and Methuen. When we say "awarded" it means we were selected through the request for proposal (RFP) process and are now negotiating the utility credit purchase agreements (UCPA) with the municipalities."

Borrego is also short-listed as a bidder on five other solar landfill projects in Massachusetts.

Installing a large-scale PV array at Easthampton without penetrating the top soil cap will be accomplished with a ballasted-racking system. Racks of PV panels will be anchored to a series of 5,000 lb. reinforced concrete blocks, or ballasts, that sit atop the cap. Ballasts can be performed off site and placed on a landfill, but in the case of Easthampton they will be poured in place because the site was capped over 20 years ago and most settling has occurred. One of the challenges of installing solar on capped sites is the limitation on the weight of equipment that can work on the landfill.

"Most experts say that the majority of settling occurs in the first 10 years and varies depending of what is in the landfill. We are designing a ballasted system that can withstand a few feet of further settling over the 20 year life of the solar system," said Harrison. "Easthampton is excellent for a ballasted system. It's relatively flat with a gentle 3 percent grade to the south."

DC solar power will be inverted to AC by 4, 500 kilowatt inverters, each located in a metal building next to the landfill. As part of the deal, Borrego will upgrade a mile of transmission line to three-phase power to handle the load.

"We are scheduled to break ground on the site in June and finish construction by fall. Then there will be a couple of months testing and commissioning. The system should come on line in February, 2012. This will be the largest project of its type to be built on a landfill in Massachusetts," Harrison noted.

Over the 10 year agreement, the city of Easthampton expects a cumulative cash flow of \$1,777,868. During that time, Borrego is fully responsible for operating and maintaining the system. At the end of 10 years the city can purchase the system at fair market value, have it removed by Borrego Solar with the site restored to its original condition, or renew the agreement with Borrego for 2 5-year terms.

According to Harrison, MassDEP is extremely supportive of putting solar on landfills and has streamlined the permitting process. "They have an initiative to get solar on landfills. Everyone is aligned in terms of brownfield and landfills

because it is a great application. There's only so much you can do with landfills and here's a way to generate money for the town and save taxpayers money. The two main concerns are – don't penetrate the cap and have a good stormwater runoff plan that deals with the solar installation."

"I think that the future is extremely bright for every landfill that is relatively flat and in close proximity to a three-phase transmissions line. In Massachusetts we have already identified 25 landfills that have been closed for more than 20 years that the size is large enough. There's another 150 where we don't have all of the information but we know they have potential. We are just at the tip of the iceberg, so to speak, as far as market potential is concerned," Harrison concluded.

PHOTO COURTESY OF REPUBLIC SERVICES



When completed, Republic's 1 MW system will be the largest in Georgia.

In 2009, Republic Services installed the first solar-geomembrane landfill closure system at its Tessman Road Landfill in San Antonio, Texas. According to Tony Walker, project manager at Republic, the pilot project has proved successful to date.

Now Republic has scaled up the concept and is in the midst of building the largest PV installation in all of Georgia – not conventional PV, rather a one megawatt solar-geomembrane at the company's Hickory Ridge Landfill in Atlanta. And, Republic is using a new and improved Spectro PowerCap made by Carlisle Energy Services.

At the first Texas project, the geomembrane and the solar cells were laid down separately. Now the solar cells and the membrane are integrated at the Carlisle factory, come in green rolls 12 feet wide by 200 feet long, ready to be rolled out.

"Carlisle bonds a 60 mil. Thermoplastic Polyolefin (TPO) to the solar strips at the factory. Now all we have to do is thermo seal them together on site and run lines down to the combiner boxes. It really saves on time and labor," says Walker.

Spectro PowerCap will cover roughly 10 acres on the south slope of the Hickory Ridge Landfill and is scheduled to go online this June. Under a Power Purchase Agreement, electricity will be sold to Georgia Power.

For landfill closings, solar-geomembranes are likely to spread across America. In March, the New Jersey Meadowlands Commission signed a memo of understanding with Carlisle to study the feasibility of using Spectro PowerCap at their Erie Landfill.

Putting solar on closed landfills is a great use of space that is otherwise non-productive, especially realized with the economies of scale of over one megawatt production. With municipal budget strains, they will likely be a welcomed source of income. As these early projects prove their value and as standard engineering solutions are accepted by state regulators, matting landfills and solar is looking like a very bright idea.

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Tulsa Recycle and Transfer opens Oklahoma's first materials recovery facility

Tulsa Recycle and Transfer (TRT), the only permitted recycling and waste transfer center in Tulsa, has opened Tulsa's first materials recovery facility (MRF), a specialized plant for reclaiming recyclables from trash and reducing its impact on the environment.

Automation is a key feature of the efficiency of the new MRF. The recycling process starts when trash is dumped onto conveyor belts and then taken through a series of manual and mechanical stages that separate valuable recyclables from residual material. Products, such as metal, plastic, paper and cardboard, are then baled and transferred to companies which can recycle and reuse the material. The rest is taken to the landfill for disposal.

Tom Hill, CEO of Burkett's companies, believes the new MRF technology could increase recycling rates for TRT by 35 to 40 percent. "We're now looking to recover 40 to 60 tons of cardboard from the waste stream per day!" said Hill. "And, that doesn't even count all the tons of metal, aluminum, and plastics we can also recover. While other companies love talking about their recycling efforts, the fact is, no one has recycled more materials in Tulsa over the last 24 years – over 375,000 tons since our inception. That's a record we're very proud of and look forward to continuing."

In addition to the environmental pluses, Hill expects the MRF facility to help spur economic growth in Tulsa by adding 25 to 35 new jobs initially, with the possibility of even more jobs once a second shift is added.

The company is striving to make the recycling process more family friendly for the Tulsa community. Plans are now in the works for new special tours of its MRF facility which will soon feature a viewing platform for families and school children to watch the MRF at work.



Gershow Recycling appears on National Geographic TV show

Gershow Recycling was featured in an episode of National Geographic Television's new show "Break It Down: New York Scrap Yard." The episode aired on May 5.

During the summer of 2010, National Geographic spent several hundred hours at Gershow to produce the hour-long program featuring Gershow's Medford, New York location.

According to National Geographic Television, the episode takes viewers into Gershow Recycling – a sprawling 40 acre scrap yard in Long Island. In just one day, the family-run business will crush three

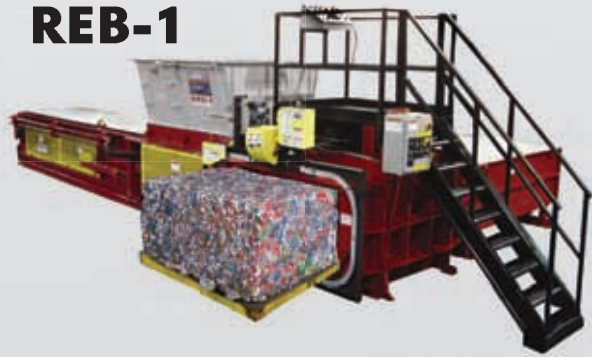
million pounds of scrap – including as many as 500 cars and 20 city buses – to create a multimillion-dollar mound of steel. This family of scrap connoisseurs has only 10 hours to get the job done.

"We are so pleased that National Geographic, known throughout the world as a leader in quality and educational programming, devoted so much time and resources to learn about our business and its importance to the economy. This program is an eye-opener to anyone interested in learning about the scrap metal industry and recycling in general," said Kevin Gershowitz, president, of Gershow Recycling.



REB-1

AND MORE...



REB-2

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WASTE

Veolia ES Solid Waste acquires waste companies

Veolia ES Solid Waste, Inc. has acquired the assets of three solid waste collection companies – JC Sanitation, LLC of McClellandtown, Pennsylvania; Treemsmith, Inc. of Tuscaloosa, Alabama and Suburban Disposal and Recycling, Inc. of Warrensburg, Illinois. All of the acquisitions are tuck-ins and will be blended in with existing Veolia operations.

The acquisition of JC Sanitation, LLC includes four residential and commercial routes and one roll-off route, which will be tucked into existing operations at Veolia's McClellandtown facility. Volumes from these routes will be internalized at the Veolia ES Chestnut Valley Landfill in McClellandtown, Pennsylvania. JC Sanitation owner Jim Collins will transition to operations manager and his drivers have been offered employment with Veolia ES Solid Waste of PA, Inc.

Assets from Treemsmith, Inc. include two roll-off trucks and containers and will tuck-in to Veolia's Tuscaloosa, Alabama operation. Veolia will take over the company's existing customer routes and will internalize the collected construction and demolition waste at the Veolia ES Eagle Bluff Landfill in Tuscaloosa, Alabama.

Suburban Disposal and Recycling, Inc., which includes residential and commercial customers across Decatur, Forsyth and Warrensburg, Illinois, will be tucked into Veolia's Decatur operations. Assets acquired include customer lists and contracts, vehicles, containers and residential carts. Waste collected will continue to be taken to the Veolia ES Valley View Landfill in Decatur, Illinois.

Details of the acquisitions were not disclosed.

IESI-BFC Ltd. changes name to Progressive Waste Solutions Ltd.

IESI-BFC Ltd. will change its name to Progressive Waste Solutions Ltd., effective immediately. The company will continue to trade under the ticker symbol BIN.

The new brand name will help the company present a unified identity to its stakeholders as it continues to grow and build a sustainable future in the communities it serves. The roll out of the new brand identity will begin in select markets, with

the full transition through the company's broader operations to take place over the next 36 months. The brand names "BFI Canada" and "Waste Services" in Canada and "IESI" and "Waste Services" in the United States will continue to operate where the new brand has not yet taken effect, but they will operate under the banner of "A Progressive Waste Solutions Company."

CONSTRUCTION & DEMOLITION

John Deere teaches students about construction industry

To help educate students considering careers in the construction industry, John Deere Construction & Forestry sponsored a team from the Bartlett, Illinois High School Academy of Science and Engineering in this year's Association of Equipment Manufacturers (AEM) Construction Challenge. The event, now in its fifth year, was held recently in Las Vegas at ConExpo, the construction industry's largest trade event.

The AEM Construction Challenge is a career-education initiative designed to help develop the construction workforce of the future by providing real-world experiences that inspire students to explore and pursue careers in the construction industry.

This is the third year John Deere Construction & Forestry has sponsored a team through its C&F Tech Program. The program is a partnership between Deere, its dealers and select community colleges around the country where students can earn a degree and work in a dealership to use the skills they've learned. It includes a curriculum that

focuses on the specific skill sets and knowledge involved in being a Deere technician.

Before the showdown in Las Vegas, teams of five to seven students, along with an adult team manager, competed at nine regional rallies across the United States. The top 24 teams advanced to the championship finals in Las Vegas.

A main component of this year's challenge was the "Road Rumble." The goal of this challenge was to design, build and test a piece of transportation equipment to move supplies, employing basic resource management principles. For competitors, the challenge also highlighted the importance of infrastructure.

While competing head to head with another team, the students built a radio-controlled piece of transportation to move building supplies from a supply site to a build site using highway and access roads on the course. They then had to construct a new headquarters building with the building supplies as quickly and efficiently as possible while meeting specifications in the provided schematics.

National Demolition Association presents environmental awards

The National Demolition Association (NDA) presented Environmental Excellence Awards to 11 companies which have performed demolition projects that have had a significant positive impact on the quality of life in the United States and Canada.

"We created the awards program to recognize NDA member companies which are true leaders in environmental stewardship, a key goal of the NDA's mission," said Michael R. Taylor, executive director of the NDA.

Several of the winning projects, which were honored at the National Demolition Association Annual Convention in Las Vegas in March, are:

Project: City of Lights Casino Removal – Alpine Demolition Services, LLC, Batavia, Illinois. Alpine Demolition Services removed a casino boat in Illinois that was catching river debris and silt. Alpine had the casino moved by a truck able tug to a suitable area for interior demolition, removal of all oils, fuel, and Freon. The casino structure was removed to the top of the existing barge. The engines and generators were salvaged for reuse and the majority of the boat's structure was recycled. The previous staging area for the casino will be developed for a park.

Project: Industrial Brownhoist Site – Bierlein Companies, Inc., Midland, Michigan. Bierlein Cos. abated the environmental hazards including asbestos, 6,000 tons of contaminated soil, and 50,000 gallons of impacted water from the 136 year old Industrial Brownhoist site in Bay City, Michigan. The removal of the structure in partnership with the City of Bay City will produce remarkable mar-

ketable waterfront property, nearly one half mile of frontage, along the Saginaw River two miles from Lake Huron.

Project: Ohio State University Medical Facilities – B&B Wrecking and Excavating, Inc., Cleveland, Ohio. As part of a \$1 billion development program at Ohio State's Medical Campus, B&B Wrecking & Excavating removed Means Hall, a former tuberculosis hospital, an MRI building, with salvage of the MRI and several connecting halls while preserving existing underground pedestrian tunnels with live utilities and communication. The project required rigid dust monitoring and recycling of all concrete, metal, and clean fill materials.

Project: Duke Energy – Environmental Holdings Group, LLC, Charlotte, North Carolina. Partnered with Duke Energy, Environmental Holdings Group launched an innovative approach to restore the natural resources and reduce the environmental footprint at three Duke Energy locations – the Lee Nuclear Site, Thorpe Hydro Plant, and Nantahala Operations Center. The effort involved relocating 23 residential homes and remediating and demolishing more than 90 other residential structures with the objective of restoring the land back to its natural state. The demolition focused on maximizing the recovery and reuse of the buildings' components while reducing the project's carbon footprint by decreasing waste, emissions, and fuel consumption as the need to transport waste offsite was minimized.

To see other project winners, view this article on www.AmericanRecycler.com.



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NISH300	3	4000	74 x 64 x 59.5	1151.47	_____
EXTRA HEAVY DUTY DUMP HOPPERS (7 GA. STEEL / 7 GA. BASE)					
NISX100	1	6000	63.5 x 41 x 38.5	\$687.13	_____
NISX200	2	6000	69.5 x 59 x 44	944.09	_____
NISX300	3	5000	74 x 64 x 59.5	1361.99	_____
NISX400	4	4000	74 x 84 x 59.5	1599.49	_____
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PAPER

Paper production reported to be up from last month

The American Forest & Paper Association released its March 2011 United States Containerboard Statistics Report.

Containerboard production rose compared to February 2011, with month over month average daily production up 0.8 percent. The containerboard operating rate for March 2011 was up 0.5 points over March 2010 to 94.1 percent.

Additional key findings include:

- Linerboard production increases over last year.

- Medium production rose over March 2010.

The March 2011 Kraft Paper Sector Report showed total Kraft paper shipments were 140.1 thousand tons, an increase of 2.1 percent compared to March 2010, and up 12.9 percent when compared to February 2011. Total inventory was 70.1 thousand tons.

Additional key findings from the report include:

- Total Unbleached Kraft shipments increased over same month last year.

- Total Bleached Kraft shipments fell compared to March 2010.

The Paperboard Report showed total boxboard production increased by 2.2 percent compared to March 2010, and increased 11.1 percent from last month.

Additional key findings in this report:

- Unbleached Kraft Folding production increased over the same month last year and last month

- Recycled Folding production increased over last month

- Inventory of Solid Bleached Kraft Paperboard rose slightly in March.

Cascades Boxboard to pay \$78,000 for reporting violations

Cascades Boxboard Group, located in Sprague, Connecticut, has agreed to pay a penalty of \$78,000 and to spend \$40,000 to improve local emergency capabilities in order to resolve EPA claims that it violated federal community right-to-know laws.

EPA's New England office alleged that Cascades Boxboard Group failed to file a chemical inventory form, known as a Tier II form, for the year 2006 for sulfuric acid stored at the facility. Sulfuric acid is considered to be an extremely hazardous substance under federal regulations and Cascades stored 57 times the minimum threshold level.

This violation of the federal Emergency Planning and Community Right-to-Know Act was discovered during an EPA inspection in September 2008. EPA

also alleged that Cascades Boxboard Group failed to file four Toxic Chemical Release Inventory forms, known as Form Rs, which are required for chemicals at the facility. These violations were discovered after EPA's inspectors noticed the company had not submitted the forms for 2007.

The environmental project will pay for emergency response equipment and training for the town of Sprague and other area emergency response units. It also requires Cascades to conduct a large-scale chemical spill exercise to gauge emergency preparedness and identify areas needing improvement.

Cascades filed the required Tier II forms for 2008 and 2009. The company also submitted the missing required Form Rs.

Smurfit-Stone reports results

Smurfit-Stone Container Corporation reported net income of \$54 million, or \$0.54 per diluted share, for the first quarter ended March 31, 2011, compared with net income of \$49 million, or \$0.49 per diluted share, for the fourth quarter of 2010, and a net loss attributable to common stockholders of (\$91) million, or (\$0.35) per diluted share, for the first quarter of 2010.

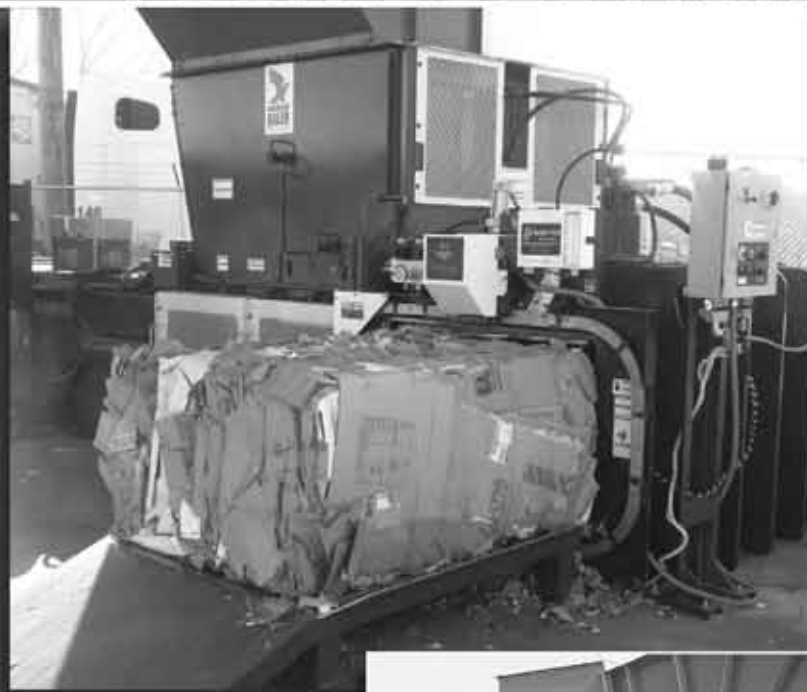
Smurfit-Stone's first quarter 2011 adjusted net income was \$43 million, or \$0.43 per diluted share, compared to adjusted net income of \$62 million, or \$0.62 per diluted share, in the fourth quarter of 2010, and an adjusted net loss of (\$59) million, or (\$0.23) per diluted share, in the first quarter of 2010. The primary adjustment in the first quarter of 2011 was the exclusion of the cellulosic biofuel production income tax credit recognized in the quarter. The major adjustments in the first and fourth quarters of 2010 were the exclusion of costs or income related to

reorganization and restructuring. The first quarter of 2010 was also adjusted to exclude the alternative fuel mixture tax credit recognized in that quarter.

The company reported operating income of \$92 million for the first quarter of 2011, compared to operating income of \$103 million in the fourth quarter of 2010, and an operating loss of \$31 million in the first quarter of 2010. Adjusted EBITDA for the first quarter of 2011 was \$179 million, down from \$205 million in the fourth quarter of 2010, and up from \$46 million in the first quarter of 2010.

Net sales for the first quarter of 2011 were \$1.58 billion, down slightly from \$1.63 billion in the fourth quarter of 2010 and up 8 percent compared with sales of \$1.46 billion in the first quarter of 2010. The sequential decline in sales in first quarter 2011 reflects modestly higher selling prices, offset by seasonally lower volumes.

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RUBBER

Synthetic turf utilized more than 105 million tires

The Synthetic Turf Council recently announced that as of 2011, the estimated total amount of synthetic turf installed in North America conserves more than three billion gallons of water, reduces smog emissions, eliminates close to a billion pounds of harmful fertilizers and pesticides, and recycles more than 105 million used tires. As a provider of tire recycling services in North America, Pittsburgh-based Liberty Tire Recycling is a part of this eco-friendly solution by manufacturing crumb rubber, an important component used in synthetic turf.

Crumb rubber derived from recycled tires enhances the performance of a variety of sports surfaces, providing infill for sports fields and paving for running tracks.

Surfaces made from crumb rubber dry quickly, drain excess moisture, reduce dust and mud, and minimize freezing.

Liberty Tire has supplied the crumb rubber for numerous synthetic turf fields across North America including: The University of Pittsburgh, Harvard University, Carnegie Mellon University, University of Michigan and Ohio State University. The rubberization of athletic surfaces offers many benefits to help prevent injuries and reduce stress on leg muscles, ligaments, tendons and joints. The specially designed infill with dust free rubber granules prevent "flyout," "splashing," and migration of the base so that traction, drainage and shock absorption are maximized.

Recycled rubber used for surfacing areas for horses

The equine performance industry reports noticeable improvement in movement, flexibility and hoof quality, and a reduction in fluid retention, when horses walk, trot and gallop on recycled rubber equine pavers.

Because recycled rubber pavers are easier to clean, and clean more thoroughly, the material is more hygienic than other flooring materials – such as wood or concrete. Cow mats made from recycled tires are increasingly used in dairy barns throughout North America.

A special report by the Center for Equine Health at the University of California, Davis, reveals that synthetic horse track surfaces have the lowest values for vibration variables, which reduces the forces incurred by bones, joints, tendons and ligaments of the equine forelimb. The results of the report indicate that synthetic surfaces have significant potential for reducing musculoskeletal injuries in thoroughbred race horses.

PLASTIC

Degradable additives provide poor end-of-life option for PET packaging

The National Association for PET Container Resources (NAPCOR) reiterated its position on degradable additives, confirming its opposition to their use in all PET packaging. The PET trade organization had previously urged caution in the use of these additives, citing lack of data about potential effects on PET recycling. NAPCOR's decision to reaffirm its public stance on this issue was prompted by continued new package introductions and related claims, without adequate new data demonstrating additives' efficacy as an end-of-life strategy, or their effects on recycling.

"There is still insufficient evidence that these additives do 'no harm' to the PET recycling stream under real-life conditions, nor is there data to confirm that the lifespan and functionality of the many next-use products made from recycled PET won't be adversely affected," said Tom Busard, NAPCOR's chairman.

Degradable additives are commonly added during the production of plastic packaging in order to promote degradation of that packaging under certain circumstances. These additives are impossible to detect visually, or through any commonly used sorting technologies. NAPCOR maintains that the use of degradable additives in PET packaging not only jeopardizes PET recycling, but runs counter to the principles of sustainability and sound envi-

ronmental stewardship, making it a poor end-of-life option:

- Increases GHGs emitted in landfills and elsewhere;
- Squanders value of the energy inherent in a plastic package that would be captured through recycling and re-converting to a new end-use application;
- Provides no nutrient value to the environment in which it decomposes;
- Endangers post consumer plastic recycling for those resins in which the additive is used;

Concern about the integrity and safety of products made from recycled materials containing degradable additives, and the lack of data on their potential effects on the PET recycling stream, prompted the plastics recycling trade organization, The Association of Postconsumer Plastic Recyclers (APR), to develop and publish test protocols in early 2010, "Degradable Additives and PET Recycling Technical Compatibility Testing Guidance."

"Although some data have come in, they are not sufficient to remove doubt about the potential effects of these additives," said APR technical director David Cornell. "Since the protocols were made public about a year ago, only a very small percentage of the manufacturers that market these products have made public any data on recycling effects. We are far from assured these products do no harm."

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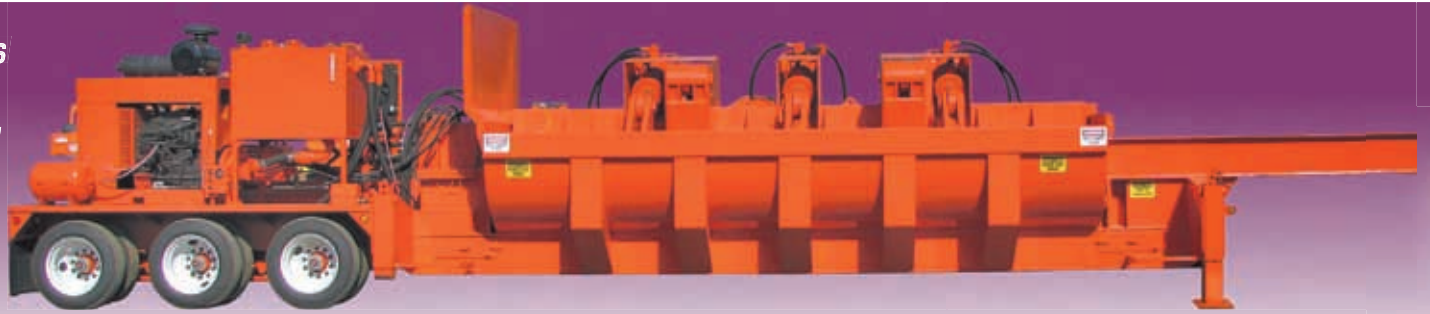
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- One NEW US Shredder Ferrous Radial Stacking Conveyor 48" x 70'.

You also get non-ferrous equipment, motors and controls, and spare wear parts — there are too many details to list here!

To see more photos of this system, visit www.dadecapital.com/shredder

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METALS

EPA begins soil clean up at Ellenville Scrap Iron

The United States Environmental Protection Agency (EPA) will begin to excavate contaminated soil on the Ellenville Scrap Iron and Metal Superfund site in Ellenville, New York and move it to the landfill on the property.

The landfill will then be securely capped to prevent contaminants from leaching out of the landfill into the ground water. The excavation of the soil, which is contaminated with hazardous chemicals and metals, is the first part of a site cleanup plan EPA selected in September 2010. Any of the excavated soil or materials that are characterized as hazardous waste will be shipped off-site for proper disposal.

EPA will perform its work at the Ellenville site in partnership with the Army Corps of Engineers and the New York State Department of Environmental Conservation (NYSDEC). The cleanup, which is expected to cost about \$8 million, is being paid for by EPA, with NYSDEC contributing 10 percent of the funding. Cleanup work at the site is expected to be completed this fall. No financially-viable potentially responsible parties exist to perform or fund the cleanup of the Ellenville site.

EPA will excavate contaminated soil from six different areas at the site, consolidate the soil on the landfill portion of the site and then securely cap the landfill. EPA will also install a series of

additional wells to monitor ground water around the site to make sure it remains free of contaminants.

EPA added the Ellenville Scrap Iron Metal site to the Superfund National Priorities List on October 7, 2002 after hazardous chemicals were found in the soil there.

The 24-acre site, which was used for scrap metal operations from the 1950s until the 1990s, is divided into upper and lower portions by a landfill, approximately 40 feet high. Soil samples at the site showed levels of semi-volatile organic compounds and heavy metals.

From 1987 to 1998, the NYSDEC inspected the site numerous times, conducted sampling and directed the owner to clean up on-site debris. The Village of Ellenville also removed a large number of tires from the site. During 2004 and 2005, EPA demolished all of the buildings at the site, and disposed of waste oil tanks and approximately 20 drums containing hazardous materials. In addition, soil contaminated with lead was removed and disposed of off-site.

In 2007, EPA began an investigation at the site to determine the full nature and extent of contamination. The results of the EPA investigation led to the selection of a cleanup plan by EPA, in consultation with the public.

Steel import permits up in April Import market share rises to 23 percent

Based on the Commerce Department's most recent Steel Import Monitoring and Analysis (SIMA) data, the American Iron and Steel Institute (AISI) reported that steel import permit applications for the month of April totaled 2,626,000 net tons (NT).

This was a 7 percent increase from the 2,455,000 permit tons recorded in March and a 7 percent increase from the March preliminary imports total of 2,446,000 NT.

Import permit tonnage for finished steel in April was 1,999,000 NT, up 8 percent from the preliminary imports total of 1,850,000 NT in March. Total imports in April were at their highest level in two-and-a-half years, and finished imports were higher than in any month since January 2009. April 2011 total and finished steel import permit tons would annualize at 27,100,000 NT and 20,964,000 NT, up 13 percent and 11 percent, respectively, from the 23,929,000 NT and 18,857,000 NT imported in 2010. The estimated finished steel import market share in April rose to 23 percent, the highest level since July 2010.

In April, the largest finished steel import permit applications for offshore countries were for Korea (347,000 NT, up 51 percent from March), India (126,000 NT, up 138 percent), Japan (116,000 NT, up 3 percent), China (104,000 NT, up 55 percent) and Turkey (93,000 NT, up 89 percent).

Finished steel import permits for major products that registered large increases in April vs. the March preliminary include plates in coils (up 85 percent), line pipe (up 69 percent), hot dipped galvanized sheet and strip (up 46 percent), reinforcing bar (up 41 percent) and hot rolled sheets (up 19 percent).

In commenting on the April 2011 SIMA data, Thomas J. Gibson, AISI president and CEO, stated that, "Finished steel imports in the month of April rose to a pre-recession level and were the highest in 27 months, as import market share increased to a 9-month high. Meanwhile, the recovery is still fragile and domestic steel production, shipments and demand – while improving – remain well below pre-recession levels. These rising import levels are a concern, and strong trade law enforcement remains critical for our industry."

Novelis sets target of recycled input material at 80 percent

Novelis Inc. set a corporate wide commitment to reduce its carbon footprint. Their new sustainability commitment calls for an intensified focus on expanding the use of recycled materials, increasing post-consumer recycling of aluminum products, and accelerating the development of new, high-recycled content alloys.

The company reported that it would increase the amount of recycled metal it uses in its rolling operations, and committed that 80 percent of its products will be made from recycled metal by 2020. Recycled metal currently accounts for 34 percent of all material used by Novelis, and the company estimates that the projected increase to 80 percent will remove ten million metric tons of greenhouse gas emissions annually from the aluminum product value chain.

This Novelis Sustainability Commitment is focused on driving improvements in three key areas:

- Raw materials – Novelis is taking steps to increase the amount of recycled aluminum it utilizes vs. primary metal to reduce the embedded carbon footprint over the lifecycle of its rolled aluminum

products and those of its customers. Novelis is planning major expansions of its recycling and remelting capacity around the globe. In addition, Novelis will expand buyback opportunities to customers for the aluminum scrap they generate in their processes.

- Post-consumer recycling – Novelis intends to increase global aluminum recycling rates primarily through innovation and expanded recycling facility infrastructure. The company will invest R&D dollars in post-consumer recycling technology, collaborating with stakeholders to expand existing recycling programs and educating consumers in the value of recycling to their communities and the world at large.

The Novelis Sustainability Commitment is being led by John Gardner, a long-time Novelis executive who was appointed vice president and chief sustainability officer beginning January 1 of this year. Reporting directly to Phil Martens, Gardner will work closely with Derek Prichett, recently appointed to the newly created position of vice president of recycling for Novelis.

AIST secures \$1,000,000 in funding

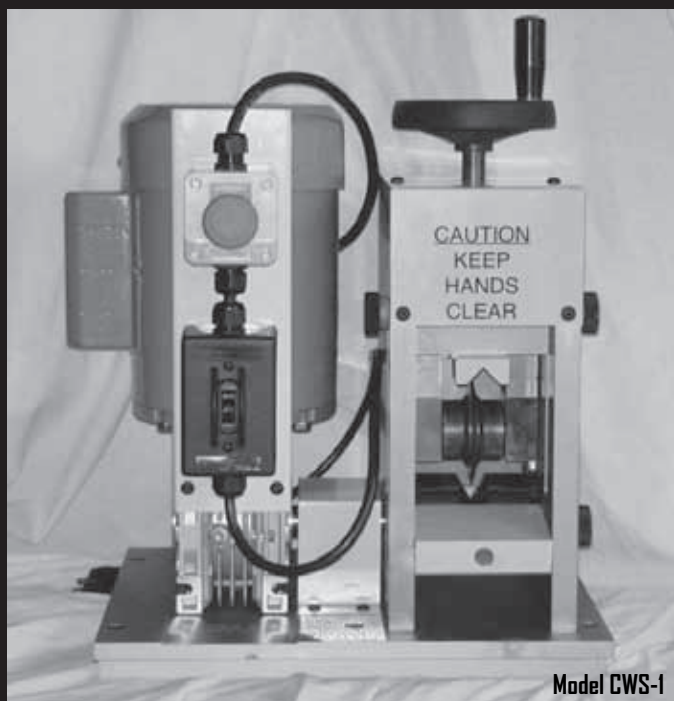
The AIST Foundation board of trustees has raised more than \$1,000,000 during the 2010–2011 academic year.

With the added incentive of a \$500,000 match from the Association for Iron & Steel Technology board of directors, the trustees secured industry pledges exceeding \$560,000.

The Foundation trustees thank its many benefactors, including Nucor, ArcelorMittal, United States Steel Corporation, SSAB North America, Hatch Associates Consultants, Steel Dynamics Inc., CMC Americas, Harsco Metals & Minerals, MCC International, Berry Metal Co. and Riverside Refractories.

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METALS

Steel imports increase 33 percent

Based on preliminary Census Bureau data, the American Iron and Steel Institute (AISI) reported that the United States imported a total of 2,446,000 net tons (NT) of steel in March, including 1,850,000 NT of finished steel (up 33 percent and 29 percent, respectively, from February final data).

Finished steel import market share in the first quarter was an estimated 20 percent and rose to 21 percent in March, the same level as it was for full year 2010.

Key finished steel products with significant import increases in March 2011 compared to February include heavy structural shapes (up 124 percent), cold rolled sheets (up 75 percent), hot dipped galvanized sheet and strip (up 44 percent), oil country goods (up 32 percent) and hot rolled sheets (up 29 percent). Major products with significant year-to-date import increases vs. the same period last year include oil

U.S. IMPORTS OF FINISHED STEEL MILL PRODUCTS BY COUNTRY OF ORIGIN (Thousands of Net Tons)					
	MAR 2011	FEB 2011	2011 Annual (est)	2010 Annual	% Change 2011 Annual vs. 2010
SOUTH KOREA	229	187	2,519	2,041	23.4%
JAPAN	113	130	1,486	1,325	12.1%
GERMANY	96	71	1,055	879	20.0%
CHINA	67	49	699	858	-18.6%
AUSTRALIA	34	53	643	519	23.8%
TURKEY	49	70	618	582	6.3%
BRAZIL	73	9	417	332	25.6%
All Others	1,190	871	12,519	12,321	1.6%
TOTAL	1,860	1,438	19,956	18,857	5.8%

country goods (up 85 percent) and reinforcing bar (up 74 percent).

In March, the largest volumes of finished steel imports from offshore were from South Korea (229,000, up 23 percent), Japan (113,000 NT, down 13 percent), Germany (96,000 up 35 per-

cent), Brazil (73,000 NT, up 734 percent) and China (67,000, up 37 percent). For the first 3 months of 2011, the largest offshore suppliers were South Korea (630,000, up 76 percent), Japan (372,000 NT, up 11 percent) and Germany (264,000 NT, up 29 percent).

Steel Dynamics names Millett president and CEO

Steel Dynamics, Inc. announced that its board of directors has approved the appointment of Mark D. Millett to the new position of president and chief operating officer, effective immediately.

Millett, a co-founder of the company in 1993, has been executive vice president for Metals Recycling and Ferrous Resources as well as president and COO of OmniSource Corporation, a wholly owned subsidiary, since August 2008. In those capacities, Millett has been responsible for the company's resources platform,

which includes all ferrous and nonferrous scrap operations and ironmaking initiatives.

Millett, a company director, will continue to report to co-founder, chairman and CEO Keith E. Busse. Millett will assume direct management of the operating leadership team, with all executive vice presidents, except for the CFO, reporting directly to him. Millett will continue to work with the chairman on executing the company's growth strategies. A search is underway to fill the position Mil-

lett will be relinquishing. Until then, Millett will continue to fulfill these responsibilities.

Previously, Millett was employed by Nucor Corporation for 12 years, where he served in several key positions, including the design, construction and operation of the melting and casting facility at the world's first thin-slab mini mill in Crawfordsville, Indiana.

Never go to bed angry – stay awake and plot your revenge.

AIST chooses new board and officers

R. Joseph Stratman, executive vice president, Nucor Corp., Charlotte, North Carolina, has been appointed president of the Association for Iron & Steel Technology (AIST) for 2011–2012. He succeeds past president William P. Breedlove.

AIST announces its new executive committee and board of directors during AISTech 2011, the organization's annual conference and exposition.

Also appointed as officers were:

- First vice president – Kent D. Peaslee, F. Kenneth Iverson, steelmaking chair, Missouri University of Science & Technology, Rolla, Missouri.

- Second vice president – Terry G. Fedor II, vice president – metallurgy, Cliffs Natural Resources, Cleveland, Ohio.

- Past president: William P. Breedlove, executive vice president, marketing and business development, Harsco Metals and Minerals, Seven Fields, Pennsylvania.

- Officer-at-large – Glenn A. Pushis, vice president and general manager, Steel Dynamics Inc. – Flat Roll Division, Butler, Indiana.

- Officer-at-large: Michael D. Garcia, senior vice president, manufacturing and supply chain, Evraz Inc. NA, Portland, Oregon.

- Officer-at-large – George J. Koenig, president, Berry Metal Co., Harmony, Pennsylvania.

- Treasurer – William C. King, II, assistant corporate controller, United States Steel Corporation, Pittsburgh, Pennsylvania.

Commodity		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
#1 Bushelings	per gross ton	\$345.00	\$347.00	\$350.00	\$389.00	\$450.00
#1 Bundles	per gross ton	345.00	345.00	350.00	384.00	427.00
Plate and Structural	per gross ton	385.00	342.00	342.00	380.00	390.00
#1 & 2 Mixed Steel	per gross ton	395.00	365.00	367.00	390.00	380.00
Shredder Bundles (tin)	per gross ton	330.00	305.00	305.00	300.00	308.00
Crushed Auto Bodies	per gross ton	330.00	305.00	305.00	300.00	310.00
Steel Turnings	per pound	—	208.00	250.00	210.00	250.00
#1 Copper	per pound	3.65	3.60	3.61	3.52	3.62
#2 Copper	per pound	3.49	3.47	3.48	3.41	3.50
Aluminum Cans	per pound	.88	.76	.77	.85	.98
Auto Radiators	per pound	2.21	2.14	2.15	2.00	2.20
Aluminum Core Radiators	per pound	.80	.79	.80	.83	.82
Heater Cores	per pound	1.20	1.80	1.85	1.77	1.93
Stainless Steel	per pound	.85	1.08	.99	1.06	.87

All prices are expressed in USD. Printed as a reader service only.

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SALVAGING Millions

by Ron Sturgeon
Autosalvageconsultant.com

All I need is money

This is first of a series, co-authored by Ron Sturgeon and Greg Morse, founder and president of Worthington National Bank.

If you ask most people what their greatest business need is, they'll answer "money." Whether that business has been around for years, is a start-up venture or is still a plan written on a scrap of paper, many entrepreneurs believe that the only thing holding them back is a bigger supply of money.

That's probably the furthest thing from the truth. If you give a struggling business more money, chances are good that all it's going to do is lose more money. Why? Because that business hasn't figured out what its true business issues are. The owner hasn't taken the time to address the genuine problems facing his or her business – so more money is only going to feed those problems.

The truth is, there is plenty of money in the world today. Banks are sitting on money, investors are sitting on money and individuals are sitting on money – all waiting for the right opportunity to put that money to work. And while there are millions of ideas for businesses out there, very few people can take those ideas, connect them with the money and turn them into successful ventures.

Lesson 1: Know what you need – and why you need it.

Greg: As a banker, I constantly see people who think all they need is more money. For example, I had a prospect that came into the bank who owned an ice cream store. He and his buddy had gone into business together and each of them had put in \$100,000, and now they're both broke and don't know what to do. They were delinquent on payroll, owed back taxes and had no business plan. A business plan needs to be clearly articulated, to include directions how one will reach their vision.

What he did have was a big pile of receipts – a pretty good sign that he didn't know where he had been or where he was going. He thought they had a competitive advantage with this ice cream they were selling, but he hadn't even thought about how many scoops of ice cream he had to sell just to pay to finish out his building! If you can't put your competitive advantage into numbers, is it really a competitive advantage?

You have to know how much money you need now. You have to know why you need it. And you have to know how much you're going to need going forward.

Ron: So, he hadn't figured out what his metrics were? Metrics are the numerical measurements of performance for a business. The simplest might be sales per month, but many more are needed to understand your business, such as more complex ones like average client acquisition cost.

In [my book] Green Weenies, we had a question: "How big is the hole and how are we going to fill it?" In other words, how big is the deficit, and what plan can we devise to erase it? It's an estimate of how much sales or income you'll need to solve the problem.

Greg: That's a good point. I asked this prospect, "How much money are you going to lose every month?" and he said, "I don't know that we do lose money every month." He had no idea what his financial statements said.

Ron: Customers who are heading to the bank looking for a loan need to look over their financial statements and meet with their accountant to make sure they understand what all the numbers mean. And if you don't understand them, you need to bring someone to the bank with you who does!

If a banker gets a sense that you don't understand the financials, then the banker wants to know that you have someone credible working for or with you who does understand them and can give you that information. But to go into a bank and not understand what's going on with your financial statements is a critical mistake.

Doing the work to get there means taking the idea from your head and putting it into a solid plan. It means creating a business plan that is honest and viable and defines your objectives, possible pitfalls and your action plan for making it happen.

In the next article we'll move on to business plans, managing your credit, the optics of presenting your loan and much more that you may not have known about how banks work, from the credit approval process to some big traps to avoid.

Remember, only you can make BUSINESS GREAT!

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—John Kitchens, Vice President
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AUTOMOTIVE

Recyclers ask EPA to revise stormwater permitting

The Automotive Recyclers Association (ARA) urged the Environmental Protection Agency (EPA) to retract its November, 2010 Guidance Memorandum that encourages state permitting authorities to measure industrial stormwater discharges through numeric effluent limits rather than use the traditional and effective best management practices (bmp) approach.

"This memorandum goes well beyond simply updating a policy as EPA suggests," said ARA's CEO Michael E. Wilson. "Rather, it appears to represent a major shift in how best to measure stormwater discharges – a change that ARA believes to be wholly unnecessary and done in an inappropriate manner," Wilson added.

ARA made this request in response to EPA's invitation to concerned stakeholders to comment on its Memorandum – an invitation tendered only after EPA received numerous objections that they had not been made aware of the change nor given an opportunity to comment before it was finalized. In its communication to EPA, ARA voiced serious concerns about the

procedural process surrounding the Guidance Memorandum as well as the potential negative impacts of the EPA's stormwater measurement recommendations on both the environment and the industry.

ARA believes that rulings of past court cases and the provisions of both the Small Business Regulatory Enforcement Fairness Act of 1996 and recent Presidential Executive Orders require that EPA follow the formal notice and comment rulemaking process for a change of this significance.

Even more importantly however, ARA asserted that if the appropriate rule-making procedures had been followed initially, then EPA would have heard real world examples of how the longstanding process of measuring stormwater discharges through best management practices and benchmarks is far more effective than the proposed system of numeric effluent limits. Further, as part of this process, EPA would have realized that the automotive recycling industry and others with stormwater discharges are committed to protecting our nation's waterways – but they need the proper tools to do so.

Ford partners on nation's first hybrid school bus conversion

The Ford Motor Company Fund and the Georgia Institute of Technology are partnering on the nation's first conversion of a traditional school bus to a hydraulic hybrid vehicle that runs on recycled bio-fuel. Atlanta Public Schools (APS) donated the bus for the project.

Conducted by Georgia Tech, the project is financed by a \$50,000 Ford College Community Challenge Grant, one of five given annually for a student-led project that matches university resources with community need related to sustainability.

This project focuses on converting existing school buses into hydraulic hybrids, which could lower greenhouse emissions and reduce transportation costs for schools.

Michael Leamy, Georgia Tech assistant professor of mechanical engineering

and his students, have designed the hydraulic hybrid system for the 16-passenger school bus.

Students at Mary Lin Elementary School are painting "the Green Eco School Bus" green and organizing a drive to collect used cooking oil for processing into biodiesel, a renewable energy source.

This project includes a cost-benefit analysis of a large-scale conversion of a school bus fleet to hydraulic hybrid powertrains designed to recover lost braking energy. Leamy said, "We expect our research will lead to cleaner, more efficient school buses that will help school districts like APS significantly reduce fuel costs and greenhouse gas emissions."

Atlanta Public School officials are using the project to educate the next generation about green energy.

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INTERNATIONAL

Frigoglass expands operations

Frigoglass, a glass bottle producer in West Africa, has reached an agreement to acquire 80 percent of the shareholding in the Dubai-based glass bottle and jar manufacturer, Jebel Ali Container Glass Factory Fze (JAG).

JAG is located in the Jebel Ali Free Zone and produces glass bottles and jars for beverage and food companies. Since the start of operations in 1997, JAG has been a competitive player in the international market with exports to South and East Africa, which provides a complementary regional fit for the Frigoglass glass operations currently focused in West Africa. Furthermore, JAG exports to Asia, the fastest growing market for glass, and to Europe, thus providing Frigoglass the opportunity to capitalize on its strong position in several markets and

to further strengthen its customer relationships in these regions.

Within its facility, JAG houses state-of-the-art machinery and equipment including the Sorg end-fired twin-pass regenerative furnace, which was commissioned in 2009 and is highly energy efficient with a capacity exceeding 360 tons per day.

Currently, the total number of employees is 340 people with strong technical experience. JAG achieved sales of \$41.6 million in 2010.

Frigoglass will acquire 80 percent of Jebel Ali for a cash consideration of \$6.8 million assuming net debt of \$23 million. The transaction, together with additional working capital requirements, is expected to be financed through new debt.

IFC invests in new paper mill

IFC, a member of the World Bank Group, is investing to complete the construction of El Motaheda S.A.E.'s new paper mill outside Cairo to reduce greenhouse gas emissions in Egypt.

IFC will invest up to \$10 million in equity and provide a loan of up to \$15.5 million toward completing the paper plant, which will be located in the Sadat City industrial zone. The plant is expected to use recycled fiber from local wastepaper as the main raw material to produce duplex board. The mill will create an estimated 300 direct manufacturing jobs and 550 indirect jobs through the collection and transport of wastepaper.

In addition, the availability of high-quality locally produced duplex will help replace imports and benefit domestic and regional consumer goods companies, local consumers, and the local economy by reducing costs.

Egypt produces an estimated 60,000 tons of solid waste each day, of which around 12,000 tons is paper, yet the country imports wastepaper and pulp for its paper product industries. The new mill and its domestic supply chain promise to significantly reduce the volume of discarded wastepaper and carbon emissions from its decay.

Novelis increases aluminum rolling capacity and recycling in Asia

Novelis Inc. will invest approximately \$400 million to expand its aluminum rolling and recycling operations in South Korea in response to the growing demand for its products in Asia and the Middle East.

The rolling expansion, which will include investments in both hot rolling and cold rolling operations, will increase Novelis' aluminum sheet capacity in Asia to one million metric tons annually. A response to projected market growth in the region, the move is designed to rapidly bring to market high-quality aluminum rolling capacity aligned with the projected needs of a growing customer base. The new capacity is expected to come on stream in late 2013.

The move follows a year-long assessment by Novelis of strategic opportunities to serve rapidly growing markets in Asia and the Middle East.

The expansion will increase Novelis' aluminum sheet capacity in Asia by more than 50 percent, and will also include the construction of a state-of-the-art recycling center for used aluminum beverage cans and a casting operation with annual production capacity in excess of 220,000 metric tons of sheet ingot.

The recycling component of the investment is further indication of Novelis' emphasis on recycling as a core part of its business. Novelis currently obtains used aluminum beverage cans from across Asia and recycles them into new can sheet in partnership with third party processors. The new recycling center at Yeongju will be Novelis' first integrated recycling and casting facility in Asia. The company is already a leader in can recycling in North America, Europe and South America.

A policeman pulled a car over and told the man driving that he was going 50 mph in a 40 mph zone.

"I was only going 40!" the driver protested.

"Not according to my radar," the officer replied.

"Yes, I was!" the man shouted back.

"No you weren't!" the policeman said, starting to get annoyed. With that, the man's wife leaned toward the window and said, "Officer, I should warn you not to argue with my husband when he's been drinking."

Regulatory pressures provide growth momentum to the European recycling market

Europe maintains a strong position in the global recycling market. Germany has been a key contributor to this position due to its technological leadership as well as strong commitment to addressing environmental concerns such as waste management through active legislation.

New analysis from Frost & Sullivan finds that the market earned revenues of \$6.1 billion in 2009 and estimates this to reach \$7.47 billion in 2016.

The effect of European stimulated policies and legislation, particularly the Waste Framework and EU Landfill Directive, is mainly responsible for the shift away from landfilling towards recycling. They stipulate the amount of waste going towards landfill as the last resort and thereby stimulate other alternatives for waste treatment including recycling and reuse.

A key challenge remains the legislative variations across the region. With each

member state transposing EU directives into their national laws, there is a significant amount of local and regional variation that exists across Europe.

Moreover, this high level of regional diversity has opened up the market to a number of local companies that specialize solely in waste management. At the same time, it has motivated even large multinational companies to establish a local presence in individual markets to cover them comprehensively. Legislative variations have underpinned the critical importance of gaining an understanding of local collection and waste management techniques.

Having a local base is, therefore, essential in this market, as regional variations require a keen understanding of local dynamics. A local base, in turn, provides an avenue to develop an understanding of local practices prevalent in waste management.

Fox acquires Resource Polymer's assets

Fox Petroleum Inc. has finalized its purchase of the recycling assets associated with Resource Polymers Inc. of Hamilton, Ontario Canada.

The acquisition was completed by a share exchange agreement in the summer of 2010 but closed in April after final receipt of the companies PCAOB audit. The company exchanged 1,750,000 shares

of restricted common stock and assumed the debts of Ontario Inc. when the transaction was announced.

In addition to its plastics recycling operations Fox Petroleum is actively seeking partnerships and joint ventures across a variety of oil and natural gas projects located within North America including the Fayetteville shale.

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AK7000	40-45 transmissions	1,200-1,500 lbs.
AK8000	50-55 transmissions	3,000-3,200 lbs.
AK8500	70-80 transmissions	4,500-5,000 lbs.

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BUSINESS BRIEFS

Commercial Metals appoints Barbara Smith

Commercial Metals Company has appointed Barbara R. Smith as senior vice president and chief financial officer for the company. In this position, Smith will have responsibility for all financial functions of the company.

Prior to joining CMC, Smith was the vice president and chief financial officer for Gerdau Ameristeel in Tampa, Florida. She also served as senior vice president and chief financial officer for FARO Technologies, Inc. in Orlando, Florida. Her career included 24 years' service with Alcoa Inc. where Smith held a variety of financial leadership positions including vice president of finance for Alcoa's Aerospace, Automotive and Commercial Transportation Group; vice president and chief financial officer, Alcoa Fujikura Ltd.; and director of internal audit.

Smith was recently elected to the board of directors for Minerals Technology, Inc.

Smith will succeed Bill Larson who has been with CMC for 20 years, the last 12 in the role of CFO.

Hard work has a future payoff, laziness pays off now.

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Choice Environmental acquires Lawson Sanitation

Swisher Hygiene Inc.'s subsidiary Choice Environmental Services will acquire Lawson Sanitation LLC, a Miami-based solid waste services provider. Swisher agreed to pay up to \$5.5 million in cash, assume certain liabilities and issue of up to nearly a million common shares of Swisher stock, subject to certain conditions and approval of the Toronto Stock Exchange. Lawson has been in business since 2003 and serves commercial and residential customers in South Florida with a range of waste and recycling services. Lawson has been led by founder John Lawson, Jr., who brings 22 years of experience to the Choice Environmental team.

IESI-BFC Ltd. reports increased revenues

IESI-BFC Ltd. reported financial results for the three months ended March 31, 2011.

Reported revenues increased \$158.8 million or 60.1 percent from \$264.0 million in the first quarter of 2010 to \$422.9 million in the first quarter of 2011 due in large part to our acquisition of Waste Services, Inc.

Organic gross revenue, which includes intercompany revenues, grew 3.9 percent on a consolidated basis and is comprised of total price and volume growth of 3.3 percent and 0.6 percent, respectively. Total price and volume improvements in Canada were 4.2 percent and 0.7 percent, respectively, and 2.6 percent and 0.5 percent in the United States. Each revenue growth component has been prepared on a comparable basis, as if WSI's operations were combined with ours in the current and previously comparable quarter, and has assumed a foreign currency exchange rate of parity when prepared on a consolidated basis.

Warfield appointed development manager

Bill Warfield has been appointed to the position of business development manager of Geotechnical Drilling and Exploration (GDE) for Atlas Copco Construction & Mining, effective immediately.

In his new role, Warfield will work with Atlas Copco sales staff as well as engineering firms and contractors around the country to promote the entire GDE product line.

Most recently, Warfield had been product manager of Ground Engineering Products for Atlas Copco.

Round2 Inc. achieves R2 Certification

Round2 Inc., an eRecycling service provider, has achieved the Responsible Recycling (R2) certification for processing facilities in Austin and Coppell, Texas, as well as, Grove City, Ohio. Endorsed by the Environmental Protection Agency, the R2 Practices for Electronics Recyclers establish a hierarchy for the safe and responsible handling of electronic waste.

Metalico reports strong quarterly earnings

Metalico, Inc. reported earnings of \$0.19 per share and net income of \$8.8 million for the first quarter, with significant increases in sales and operating and net income.

The company posted sales of \$182 million for the quarter ended March 31, 2011, compared to \$134.1 million for the comparable 2010 quarter when it reported net income of \$3.5 million or \$0.08 per share. All per-share calculations are on a diluted basis.

Operating income increased 25 percent for the first quarter to \$17 million, compared to \$13.6 million for the prior-year period.

Effective January 1, 2011, the company has identified Platinum Group Metals (PGM) and Minor Metals Recycling as a new operating segment as a result of its growing importance. PGM and Minor Metals performance was previously included in the Scrap Metal Recycling segment.

Metalico's management said the separation clarifies distinctions between the company's traditional scrap metal recycling operations and the operations of its specialized PGM and higher-value Minor Metals recycling for reporting purposes. Platinum Group Metals include platinum, palladium, and rhodium, and Minor Metals include molybdenum, tantalum, tungsten, niobium, rhenium, manganese and chrome.

Where applicable, all previous year information reported by the company has been adjusted to reflect comparable data.

Bateman Manufacturing relocates operations

Bateman Manufacturing Inc. relocated their manufacturing operations from Orillia, Ontario to a larger facility in Shanty bay, Ontario. The growing demand for Bateman's grapples and attachments has resulted in a decision to move to a larger facility that is designed for fabricating standard and custom attachments of all sizes.

Bateman also welcomed David Carey as its new sales and marketing manager. Carey brings with him 30 plus years of experience in the construction equipment industry.

The company expects production to be back to 100 percent by early June.

Becker appointed to sales team for Atlas Copco

Scott L. Becker has been appointed to the Surface Drilling Equipment (SDE) sales team at Atlas Copco's Baltimore store. In his new role, Becker will report directly to Edward J. Hullet Sr., branch manager at the Baltimore location.

Becker has worked in the construction equipment industry since 1995. This includes five years in the drilling sector.

Which side of a dog has the most hair?

The out side.

Schnitzer acquires American Metal Group

Schnitzer Steel Industries, Inc. has acquired substantially all of the assets of American Metal Group, Inc. and certain of its affiliates which operate from facilities in San Jose and Santa Clara, California.

Terms of the transaction were not disclosed.

Road Machinery new Terex Fuchs distributor

Road Machinery, LLC now distributes the full line of Terex Fuchs material handling machines built for scrap, port-side and recycling applications. These machines are offered at its branches throughout Arizona, California and New Mexico, in addition to a location in El Paso, Texas.

Road Machinery, LLC began in 1955 in Phoenix as a sales and service based company for heavy machinery. The company experienced rapid growth and has since advanced to offer machines serving the construction, mining, road paving, industrial, energy, forestry and government segments. Today, Road Machinery has 14 locations throughout the states of Arizona, California and New Mexico, with one location in El Paso, Texas, and two locations in Mexico.

Copart, Inc. to relocate corporate headquarters

Copart, Inc. announced that it will be relocating its corporate headquarters to Dallas, Texas in 2012. Copart will also create three divisional processing centers located in Fairfield, California, Grand Prairie, Texas and Hartford, Connecticut. Certain functions currently performed at the Fairfield, California corporate headquarters will transition to these centers over the next two years.

Events Calendar

June 6th-7th

Northeast Recycling Conference and Expo. Radisson, Manchester, New Hampshire. 800-223-0150 • www.nrra.net

June 21st-24th

Air & Waste Management's 104th Annual Conference and Exhibition. Disney's Coronado Springs Resort, Orlando, Florida. 412-904-6003 • www.awma.org

August 23rd-25th

WASTECON 2011. Gaylord Opryland, Nashville, Tennessee. 240-494-2237 • www.wastecon.org

September 19th-21st

Arkansas Recycling Coalition Conference & Expo. Best Western Inn of the Ozarks & Convention Center. Eureka Springs, Arkansas. 866-290-1429 • www.recycleark.org

September 21st-23rd

16th International Congress for Battery Recycling (ICBR 2011). Grand Hotel Excelsior, Venice, Italy. +41 62 785 10 00 • www.icm.ch

BUSINESS BRIEFS

Manufacturing team grows at Bunting Magnetics

■ Bunting Magnetics Co, headquartered in Newton, Kansas, announced the addition of Matt Anderson, manufacturing engineer, and Kenton Stumps, as a design engineer for their material handling product line.

Anderson will handle the overall workflow of active orders between our Technical Services group and the plant floor operations. Anderson has several years of experience in sheet metal fabrication and shop floor planning along with previous experience in CAD/CAM systems, job routing and tooling design. In the past, Anderson has designed and engineered new products for Weckworth Manufacturing in Haysville, Kansas and Hehr International in Newton, Kansas.

Stumps holds a Bachelor of Science degree in Mechanical Engineering from Wichita State University. Stumps has experience in the aerospace, construction and manufacturing sectors. He has a deep background in Catia V5, Solid Works and AutoCad software programs.

Stericycle acquires Healthcare Waste Solutions

■ Stericycle, Inc. has completed the acquisition of former rival Healthcare Waste Solutions (HWS), originally announced last September, from Altaris Capital Partners, LLC for \$245 million.

HWS is expected to add about \$45 million in annualized revenues. The United States Department of Justice (DOJ) and the state of New York cleared the transaction after Stericycle agreed to divest some of its New York assets, including a transfer station in the Bronx. The DOJ's antitrust division, along with the attorney general of the state of New York, filed a civil antitrust lawsuit under the Hart-Scott-Rodino Antitrust Improvements Act of 1976 in U.S. District Court in Washington, D.C., to block the proposed transaction. Consequently, the value of the deal was reduced by \$8 million to reflect the divestiture, various other adjustments, and a reduction for HWS's indebtedness as of the closing date.

Derek Anderson appointed new district manager

■ Derek Anderson has accepted the new position of district manager for the South Central region of Atlas Copco's Drilling Solutions (ADS,) Rock Drilling Tools, Surface Drilling Equipment, and Geotechnical Drilling and Exploration (GDE) product lines. His responsibilities include working with Atlas Copco distributors Luby Equipment and Venture Drilling Supply. In his new role, Anderson will continue to report directly to Scott Slater, business line manager for GDE and ADS Oil & Gas.

Anderson has worked for Ingersoll-Rand and Atlas Copco for a combined total of 15 years.

In addition to a focus on oil and gas related products, Anderson will be giving special attention to the quarry, mining and construction industries.

Schnitzer board declares quarterly dividend

■ The board of directors of Schnitzer Steel Industries, Inc. declared a cash dividend of \$0.017 per common share, payable on June 2, 2011, to shareholders of record on May 19, 2011. Schnitzer has paid a dividend every quarter since going public in November 1993.

ALL Erection & Crane Rental Corp. expands

■ The ALL Erection & Crane Rental Corp. Family of Companies announced the expansion of their facilities with two branch relocations: one in St. Albans to Nitro, West Virginia and one in Tampa, Florida.

Crane & Equipment Rental Corp., formerly of St. Albans, West Virginia, celebrated its move to a larger facility in nearby Nitro with a day of grand opening festivities. With 38,000 sq.ft. under one roof, the new location will allow the company to organize its space to service customers more efficiently. Increased shop space will allow the staff to complete more work in a shorter amount of time, and with better oversight and supervision by shop foremen.

ALL Crane Rental of Florida in Tampa moved to 10 acre property, formerly occupied by another heavy equipment company. It offers 5 state-of-the-art buildings, including a 5,800 sq.ft. office, a 1,600 sq. ft. safety and training building; two shops with a total of 8 service bays; paint booths; and a large equipment yard.

Sims Metal acquires UK Metals Recycler

■ Sims Metal Management's subsidiary, Sims Group UK Ltd., has completed the acquisition of Dunn Brothers Limited, a UK metals recycling business.

Dunn, a full-service ferrous and non-ferrous recycler, operates 9 facilities that include a 6,000 horsepower shredder, nonferrous recovery systems and dock facilities. Dunn's key shredding and non-ferrous recycling assets are located in its Birmingham facilities and are supported by a collection and export infrastructure extending from Southampton in the south, Ipswich in the east, Liverpool in the northwest, Avonmouth in the southwest and Barry in Wales. Dunn processes approximately 35,000 tons of scrap metal per month.

Eriez hires new heavy industries sales engineer

■ Eriez announced the appointment of Brian Vrablic to the new position of sales engineer – recycling.

In his new role, Vrablic will support the Eriez Heavy Industries Group, which is led by Dan Norrgran, heavy industries market manager. He will work closely with Al Gedgudas, resource recovery market manager, and Mike Shattuck, heavy industries project manager, selling Eriez solutions to the metals recycling market.

NEW PRODUCT SHOWCASE



CASE RELEASES PT240 PNEUMATIC TIRE COMPACTOR

Case Construction Equipment introduced the PT240 pneumatic tire compactor. With a turbocharged engine rated at 99 hp, the compactor can operate on grades up to 25 degrees. The PT240 has a compaction width of 78", suitable for production asphalt paving projects. A standard air-on-the-run central tire inflation system ensures proper tire inflation at all times and optimizes rolling performance.

It also includes high-capacity water and fuel tanks. The corrosion-proof, pressurized water system features a 122-gallon polyethylene water tank. A 66-gallon fuel tank is standard.

Case Construction Equipment
621 State Street
Racine, WI 53402
866-542-2736
www.casece.com



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The new Eriez CleanStream™ Process combines Eriez' P-Rex™ Drum and new Shred1™ Separator to improve ferrous recovery by one to two percent while producing a low copper content #1 shred.

Materials first pass through a permanent rare earth drum magnet to recover ferrous material. The magnetic circuit is up to 40 percent stronger than an electro drum. Then materials go on to the Shred1 Separator, which automatically separates ferrous from mixed metals and waste. This greatly reduces material volume, so the hand picking stations require fewer picking personnel.

Eriez
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Erie, PA 16506
888-300-3743
www.eriez.com



MORBARK DEBUTS ADVANTAGE 3 CHIPPING DRUM

Morbark introduces its new Advantage 3 high performance chipping drum, which significantly improves chip-quality in wood chipping equipment and reduces recurring wear-part and maintenance costs approximately 70 percent. Changes were made to the pocket, knife, and knife-holding assembly where the maintenance and wear costs are incurred. The new design includes increased clamping force and more durable knives with an increased number of possible sharpening occurrences – extended time and production in between each sharpening. Changes were also made to the drum shaft to reduce stress and increase durability.

Morbark, Inc.
8507 S. Winn Road
Winn, MI 48896
989-866-2381
www.Morbark.com



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Shred-Tech's MDX-1, an ultra high security mobile shredder, is not reliant on screens or stacked shredders. It's capable of switching between standard and high security modes. In standard mode, the ST-15H shredder achieves 6,500 lbs. per hour of throughput. High security mode produces incredibly small shred while maintaining throughput of 2,500 lbs. per hour.

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Apex, NC 27502
800-465-3214
www.shred-tech.com



WINKLE'S NEW OPTIMAG L-SERIES LIFTING MAGNETS

Winkle Industries' new line-up of OptiMag "L-Series" lifting magnets for scrap recyclers now include two model ranges, the LDSA magnets and a ELDSA line created specifically for smaller hydraulic scrap handling machines. The new L-Series models offer increased lifting capacity with lighter weight magnets.

LDSA magnets range in weight from 1,025 to 7,750 lbs., with lifting capacity from 625 to 5,625 lbs. ELDSA magnets begin at 895 lbs., lifting up to 575 lbs., and range to the 72" 7,500 lb. unit able to lift up to 5,550 lbs.

Winkle Industries
2080 West Main Street
Alliance, OH 44601
330-823-9730
www.winkleindustries.com

BUSINESS BRIEFS

Winters Bros. acquires Automated Waste Disposal

■ Winters Brothers Waste Systems CT, LLC has purchased Automated Waste Disposal's companies from the U.S. Marshals Service.

Owners, Joe and Sean Winters are second generation veterans of the waste management industry having helped to build, own and operate Winters Bros. Waste Systems of Long Island.

After becoming aware of the opportunity to purchase the Automated Waste Disposal assets, Joe and Sean Winters, who will serve as the company's CEO and senior vice president respectively, assembled a team of other veteran waste management professionals to ensure a successful launch of this new business initiative. The deal was brokered by the New York-based investment banking firm of Dominick and Dominick.

Financial terms of the transaction were not disclosed.

Dr. Vijay N. Madi named chief technology officer

■ Universal Stainless & Alloy Products, Inc. announced that Vijay N. Madi, Ph.D., has been named to the position of chief technology officer.

In this position, Dr. Madi will significantly strengthen the company's technical support to customers as well as to provide the metallurgical expertise critical for its process improvement effort and product expansion strategy. Dr. Madi will lead the metallurgical process development at Universal Stainless and will oversee all company laboratory qualification and capability testing and analysis.

Dr. Madi most recently served as manager, process technology research, for AK Steel Inc in Middletown, Ohio, a post he held since 1999. Prior to 1999, Dr. Madi was employed by ARMCO where he held various senior positions including senior staff engineer and manager, steel technology.

Jeremy Hunter named GM of ALL Carolina Crane

■ The ALL Erection & Crane Rental Family of Companies has appointed Jeremy Hunter as general manager of ALL Carolina Crane Rental of Wilmington, LLC. He heads to Wilmington from the Atlanta branch of ALL Crane Rental of Georgia, where he served for 12 years as lead dispatch and logistics manager and previously as aerial dispatcher. Hunter began his career at ALL in 1997, working in the yard while attending Georgia State University, from which he graduated in 1999.

Hunter will be joined in Wilmington by his wife, Amanda Hunter, current accounts receivable and contracts manager at the Atlanta branch. She has worked for the ALL Family of Companies for almost a decade, gaining tremendous knowledge of the crane market. She will provide organizational support, ideas, and a wealth of productivity knowledge to the Wilmington branch.

Enthofen appointed product support technician

■ Aaron Enthofen has been appointed to the position of product support technician for Atlas Copco's Edge Drill Monitor product line. In his new role, Enthofen will report directly to Jason Blais, product manager, Down-The-Hole Products.

Enthofen previously was with Wellbenders Directional Service. In his new position, his primary responsibilities will include complete product support for Edge DTH drill monitoring systems, supporting both Atlas Copco store and distributor channels.

CNH opens distribution center in Missouri

■ To expedite delivery of its remanufactured products to equipment dealers throughout North America, CNH has opened a remanufactured parts distribution center within its 260,000 square foot CNH Reman operations facility in Springfield, Missouri.

The distribution center will support Case IH, Case Construction Equipment, New Holland Agriculture, New Holland Construction, Kobelco and Fiat Powertrain Technologies (FPT) dealerships in North America, by shipping high-priority remanufactured products such as those with specialized or unique configurations, directly from the Springfield plant to dealers.

CNH sees remanufactured products as an opportunity for dealers to help equipment owners and operators achieve greater productivity while lowering their total cost of ownership.

Joe Sparano named to board of directors

■ BlueFire Renewables, Inc. announced that Joe Sparano has joined the company's board of directors. As former president and, subsequently, executive advisor to the chairman of the board of the Western States Petroleum Association (WSPA), as well as former president of Tesoro Petroleum's west coast regional business unit, Sparano is a welcomed addition to the BlueFire Renewables board.

Sparano is retired from WSPA at the end of March, after completing a fifteen month term as executive advisor to the chairman of the board of the association, where he advised the chairman and supported WSPA's president on matters related to the trade organization's operations and advocacy in six western states - California, Arizona, Nevada, Washington, Oregon and Hawaii.

Sparano also serves as a member of the board of directors of CVR Energy, Inc. Previously, Sparano served as WSPA's president for almost seven years. Immediately prior to his appointment as WSPA's president, Sparano was president of Tesoro Petroleum's west coast regional business unit and vice president of the company's heavy fuels marketing segment.

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CRYSTAL AUTO PARTS: family-owned business, located in Dearborn, Michigan since 1956; holds only recycling license in city, facility on approximately 5.5 acres; well-established wholesale/retail truck parts business and scrap processing operation. Easy access to I-75 and I-94. Owner can remain on staff to assist with transition, \$750,000. Call 800-336-3348.

C&D INTERNAL RAIL TRANSFER STATION: 4.2 acres located in Westchester County, NY. Approved special use permit for 54,000 sq. ft. building. 1,500 tons per day C&D transfer. Two 2,000' spurs of rail with one inside building. D.E.C. application pending. Approved rail design with Metro North. Call 914-906-7161.

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- 2004 M322C MH** (Rubber) 41' Reach, Hyd Cab, 15KW Gen, Grapple \$209,000
- 2008 M325D LMH** (Rubber) 51' Reach, Hyd Cab, 20KW Gen, Grapple \$325,000
- 2008 M325D LMH** (Rubber) 51' Reach, Hyd Cab, 20KW Gen, Grapple \$315,000
- 2007 M325D LMH** (Rubber) 51' Reach, Hyd Cab, 20KW Gen, Grapple \$299,000
- 2006 M325C LMH** (Rubber) 51' Reach, Hyd Cab, 20KW Gen, Grapple \$279,000
- 2005 M325C LMH** (Rubber) 51' Reach, Hyd Cab, 20KW Gen, Grapple \$229,000
- 2006 M325D MH** (Rubber) 47' Reach, Hyd Cab, 20KW Gen, Grapple \$274,000
- 2005 M325C MH** (Rubber) 47' Reach, Hyd Cab, 15KW Gen, Grapple \$239,000
- 2005 M325C MH** (Rubber) 47' Reach, Hyd Cab, 15KW Gen, Grapple \$229,000
- 2007 M345C UHR** (Crawler) 80' Ultra High Reach, Tilt Cab, Grapple, POR
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- 1997 A902** (Rubber) 38' Reach, 4' Elev Cab, 9.5KW Gen, Grapple \$119,000
- 2008 A904** (Rubber) 38' Reach, Hyd Cab, 12.5KW Gen, Grapple \$229,000
- 2008 A924C** (Rubber) 45' Reach, Hyd Cab, 15KW Gen, Grapple \$229,000
- 1999 A924** (Rubber) 42' Reach, Hyd Cab, 13KW Gen, Grapple \$139,000
- 2002 A924B** (Rubber) 42' Reach, Hyd Cab, 15KW Gen, Grapple \$159,000
- 2005 A934B HD** (Rubber) 48' Reach, Hyd Cab, 20KW Gen, Grapple \$219,000
- 2006 A934B** (Rubber) 52' Reach, Hyd Cab, 17.5KW Gen, Grapple \$229,000
- 2005 A944B** (Rubber) 60' Reach, Hyd Cab, 25KW Gen, Grapple \$390,000
- 1998 A954** (Rubber) 60' Reach, Hyd Cab, 33KW Gen, Grapple \$325,000
- 2005 R934B EW** (Crawler) 48' Reach, 4' Elev Cab, Gen, Grapple \$179,000
- 2001 R934 EW** (Crawler) 52' Reach, Hyd Cab, 15KW Gen, Grapple \$159,000
- 2000 R934 EW** (Crawler) 45' Reach, 48" Elev Cab, Gen, Grapple \$89,000
- SENNEBOGEN**
- 2002 835R** (Crawler) Hyd Cab, 20KW Gen, Grapple \$199,000
- 2006 850R** (Crawler) Hyd Cab, 20KW Gen, Grapple \$299,000
- FUCHS**
- 2006 MHL320** (Rubber) 38' Reach, Hyd Cab, Gen Set & Grapple \$199,000
- 2005 MHL350** (Rubber) 49' Reach, Hyd Cab, New 17 KW Gen Set & Grapple \$215,000
- 2007 MHL360D** (Rubber) 54' Reach, Hyd Cab, Gen Set & Grapple \$360,000

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- 2002 M318 (rubber), 36' reach, A/C, hydraulic cab, gen-set and grapple.
- FUCHS**
- 2008 MHL 360 (rubber), 59' reach, hydraulic cab, gen-set and grapple.
- 2006 MHL350D (rubber), 52' reach, A/C hydraulic cab, gen-set and grapple.
- 2005 MHL 350 (rubber), 50' reach, hydraulic cab, gen-set and grapple.
- 2003 & 2006 MHL331 (rubber), 34' reach, hydraulic cab, gen-set and grapple.
- 2001 MHL360 REBUILT (rubber), 59' reach, hydraulic cab, gen-set and grapple.
- 2003 & 2007 MHL 340 (rubber), 41' reach, hydraulic cab, gen-set and grapple.
- 2001 MHL320 (rubber), 31' reach, hydraulic cab, gen-set and new 48" magnet.
- 1995 MHL 350 REBUILT (rubber), 50' reach, hydraulic cab, gen-set and grapple.
- LIEBHERR**
- 2004 R954EW (crawler), 59' reach, hydraulic cab, gen-set and grapple.
- 1999 R934EW REBUILT (crawler), 50' reach, 4' cab riser, gen-set and grapple.
- 1999 A924 (rubber), 41' reach, hydraulic cab, gen-set and grapple.
- 1994 A932 REBUILT (rubber), hydraulic cab, gen-set and grapple.
- SENNEBOGEN**
- 2007 825D (rubber), 43' reach, hydraulic cab, gen-set and grapple.
- 2005 835R (crawler) 52' reach, hydraulic cab, gen-set and grapple.
- 2006 821M (rubber), 36' reach, hydraulic cab, gen-set and grapple.
- 2005 835M REBUILT (rubber), 55' reach, hydraulic cab, gen-set and grapple.
- 2004 825M REBUILT (rubber), 43' reach, hydraulic cab, gen-set and grapple.
- 2000 830M REBUILT (rubber), 50' reach, hydraulic cab, gen-set and grapple.
- OTHERS**
- 2006 Komatsu PW220 (RUBBER), 41' reach, hydraulic cab, rotating shear and gen-set.
- 1996 KOMATSU PC240 REBUILT (crawler), 38' reach, 3' cab riser, gen-set and grapple.
- 2003 NEW HOLLAND MH (rubber), 40' reach, cab riser, gen-set and grapple.
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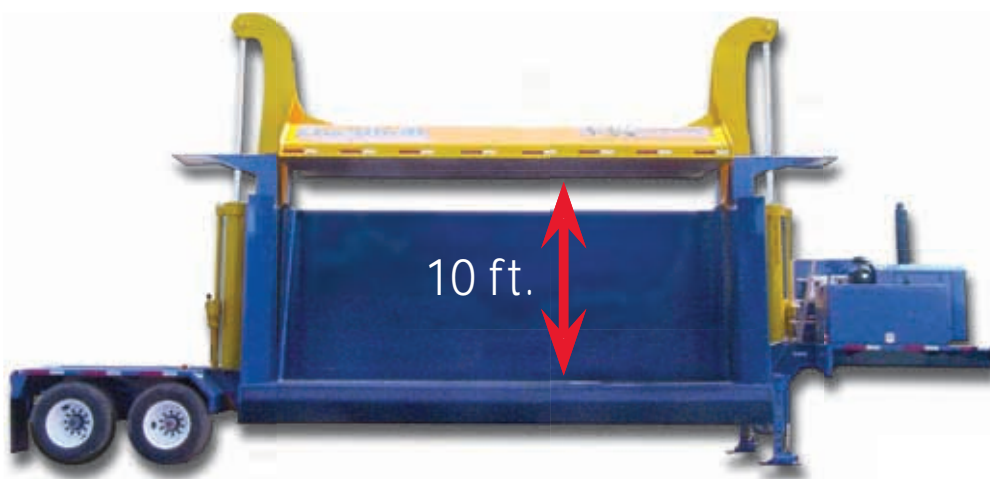
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Geothermal energy is picking up steam

by MIKE BRESLIN

mbreslin@americanrecycler.com

All the energy the world will ever need lies right beneath our feet. It's available all over the planet, even in the coldest climates. And the best part is that it's clean, safe and will be available in unlimited supply so long as the Earth's core remains hot.

Why then, are we still strapped for clean energy solutions? The answer lies in the economics of harnessing geothermal energies.

As global energy demand increases, fuel prices rise and efforts to curb greenhouse gas emissions intensify, an increasing number of countries are looking to tap geothermal resources to drive low carbon development. A clean, base-load source of power, geothermal offers consistent electricity production nearly 24 hours per day with little to no emissions – a huge advantage over the intermittency of solar and wind generation and emissions associated with other renewables such as biomass.

Many technologies are available to harvest geothermal energy. Heat can be drawn from hot water or steam reservoirs located deep in the earth and accessed by drilling, or from geothermal reservoirs located near the surface, or from near-surface that maintains a relatively constant temperature of 50 to 60 degrees Fahrenheit. Heat pumps are a widely deployed example of the latter where heat is pulled out of the ground to help heat or cool a building.

Geothermal power was first tapped in 1904 at the Larderello dry steam field in Italy. Later, the first modern geothermal power plants were built there. They were destroyed in World War II and later rebuilt. That field is still producing.

The first geothermal power plants in the United States were built in 1962 at The Geysers dry steam field in northern California. It is still the largest producing geothermal field in the world with over 20 plants. Wastewater from nearby cities is also injected into the field to provide environmentally sound disposal and increase steam to the power plants.

In 1974, the first commercial size binary-cycle geothermal power plant



Insulated pipework at a New Zealand geothermal energy facility helps tap the unlimited supplies of energy generated by the earth's heat. While geothermal energy is clean and virtually limitless, economic considerations have prevented it from becoming as popular as solar or wind power.

was built as a demonstration project by the United States Department of Energy (DOE) at Raft River, Idaho. In a binary-cycle plant, heat from geothermal water is used to vaporize a working fluid, which like steam powers a turbine-generator.

The Geothermal Energy Association (GEA) believes the industry is poised for growth and continued regional expansion in the western states where underground steam resources are most plentiful. In its annual report released March 30, GEA executive director Karl Gawell said, "The geothermal industry has an exciting year ahead, as there are numerous projects switching from development phases to full-fledged geothermal power plants. And a second wave of development is on its way. This report reveals that many projects are entering the drilling and production phase, which is where the majority of geothermal job creation is.

"Despite the slow economy, geothermal resources are being used for

power production in an expanding portion of the United States. The growth we've seen since 2005 continues in 2011. Four years ago there were four states with geothermal power production and now there are nine. In the near future there should be at least 15. And that's substantial growth," Gawell added.

The GEA annual report showed that in 2011 the geothermal industry is producing power in nine states and developing 146 projects in 15 states, with the total number of projects under development increasing 12 percent. New technologies are permitting lower temperature resources to be exploited for electric generation. The majority of the industry remains concentrated in the western states.

There are two main systems currently utilized for electric power generation. The first, and rarest, are vapor-dominated systems that yield high-temperature steam greater than 455 degrees Fahrenheit. The geysers in California are an example of this type of system

where steam is typically found at depths of 3,250 to 13,000 feet. The second type is dominated by hot water and operates in temperature ranges from 212 to 700 degrees Fahrenheit.

Geothermal energy is classified as a renewable source of electricity and considered to be a clean, environmentally friendly, sustainable method of electrical power generation.

According to a March report from Pike Research – a market research firm that analyzes clean tech markets – escalating investment in global geothermal power could result in a 134 percent increase in total geothermal capacity between 2010 and 2020, from 10.7 gigawatts to 25.1 gigawatts, under a high-growth forecast scenario. Under a more conservative forecast scenario, the firm estimated that geothermal power capacity would increase 34 percent to 14.3 gigawatts by 2020.

"Worldwide potential for geothermal energy is immense," said Peter

See **GEOTHERMAL**, Page 7

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A Letter from the Editor

Dear Readers,

Welcome to the June Edition of American Recycler. This month we turn our focus on the ever-evolving field of alternative energies.

While solar and wind energy are the rock stars in the field, innovative new ways to generate clean energy are devised every day. Keeping up with the latest biomass, landfill gas and algae-based energies isn't always easy, nor are they always suitable for immediate implementation.

However, one tried and true method of generating clean energy has seemingly faded from the public eye. Geothermal energy, around nearly as long as solar and wind, is clean, safe, and produces power in situations where wind and solar fall short. The stability of geothermal energy is particularly appealing in the wake of the recent nuclear disaster at Fukushima, and yet it is consistently passed over in favor of other means of generation.

In this month's Focus section cover story, author Mike Breslin explores exactly why this source of clean energy has fallen by the wayside in spite of its enormous benefits, and the steps that are being taken to encourage its growth.

Next month American Recycler's Focus section will cover municipalities – issues they're facing, programs they're implementing, and how efforts at the local level are driving green innovation.

Local government is uniquely suited to address local problems that sweeping federal and state legislation would otherwise overlook. Many environmental innovations start small and grow into national trends. We'd like to help jumpstart that growth by sharing your local solutions nationally, so that others can learn and emulate what works.

To this end, I'm requesting that you get in touch and fill me in on what's going on locally. Are you on the cutting edge of green technology? Or are you woefully backwards? Is the environment even an issue, or are other concerns, such as unemployment, crime rates or budget deficits, being addressed first? Have your services been expanded, or are you cutting back? I'd love to know.

I hope to hear from you all. Until next month,



Dave Fournier
Focus Section Editor
david@americanrecycler.com

K-12 solar and energy efficiency program generates \$43 million in savings

East Side Union High School District and Chevron Energy Solutions announced the completion of construction for the largest K-12 solar and energy efficiency program in the United States. The program is expected to generate \$43 million in savings through a 7.1 MW solar and energy efficiency project on 13 sites.

"Our new solar energy system and the numerous energy efficiency improvements we have made as part of this program will generate savings in the first year equivalent to the funding required for approximately 30 teacher jobs and improve the learning environment," said Lan Nguyen, president of the East Side Union High School District Board. "At a time when our district

is being forced to absorb painful budget cuts, due to the continued economic downturn, this program is a huge reason to celebrate."

East Side Union High School District expects the program will offset its annual electrical usage by more than 55 percent and supports California's clean energy goals. As a result, the district expects to reduce its purchase of utility power and in turn, reduce carbon emissions by more than 4,900 metric tons, equivalent to more than 800 football fields of pine forests. In addition, Chevron Energy Solutions delivered professional development for teachers that provided curriculum and hands-on experiments aligned with state standards helping to create a living laboratory to

empower environmental awareness and energy consciousness.

Chevron Energy Solutions designed, constructed, operates, maintains, measures and guarantees the solar system's performance for the district. The company also engineered and installed the energy efficiency improvements at the district including lighting upgrades and installation of premium efficiency motors. Chevron Energy Solutions is one of the largest installers of solar power in the United States education market and has developed hundreds of projects that improve energy efficiency and provide renewable power for education, government and business facilities.

Bosch invests millions to support higher education

Bosch is investing approximately \$10 million over 8 years to support local universities and energy research projects in North America. Part of a global initiative, the Bosch Energy Research Network (BERN) is a project that works jointly with North American universities to achieve lasting developments in research and accelerate progress in the important fields of the environment, energy and mobility. An expansion of the company's higher education funding, BERN consists of two components: research grants and internships.

In 2011, Bosch will spend over \$5 billion on global R&D activities. Approximately 45 percent of Bosch's R&D budget is focused on products that help to enhance energy efficiency and protect the environment. The BERN project is a part of the Bosch InterCampus program, a global ini-

tiative in which the company invests about \$70 million to provide support for universities and research programs focused on sustainable energy usage in Germany, China, India and the United States over the next 10 years.

Among the 34,500 Bosch researchers and developers globally, 1,800 are located in North America. The BERN project will fund 20 university research grants, with the goal of developing the best transformative energy technologies for series production. Funding will focus on several topics including energy conversion through solar energy, wind power and photovoltaics, storage technologies for transportation and utilities, and usage efficiency through microgrids and cooling systems. The research grants, each a maximum of \$125,000, will be awarded competitively on a 2-year duration

basis. For the project's initial phase, the following institutions are invited to participate: California Institute of Technology; Massachusetts Institute of Technology; Stanford University; University of California, Berkeley; and the University of Michigan. Other universities may be considered at a later phase.

Bosch will also offer 200 internships to high-potential university seniors and graduate students, in the general area of energy topics. Internship programs will be offered to some 13 universities located near key Bosch locations in North America. Each year, Bosch globally invests more than \$250 million in enhancing associates' skills through training and apprenticeship programs, cross-functional transfers and international opportunities.



A Typical (and Overwhelmingly Effective) Gas Station Display of Social Responsibility

Ontario elects to supply timber for renewable fuels

Rentech, Inc. announced that its proposed Olympiad Renewable Energy Centre has been selected by the Province of Ontario for a proposed supply of up to 1.3 million tons per year of Crown timber. The wood supply, composed primarily of forest waste and unmarketable species, would be used for the sustainable production of renewable RenJet®, Rentech's clean certified low-carbon jet fuel.

The Olympiad Project is designed to produce 23 million gallons of renewable jet fuel annually.

The proposed wood allocation to Rentech's project is the largest ever awarded in the Provincial Wood Supply Competitive Process administered by the Ontario Ministry of Northern Development, Mines and Forestry. The award would provide Rentech with a reliable long-term supply of biomass for its Olympiad Project. The Ministry selected Rentech's proposal as the best proposed use of the available timber. The selection is the first step in the process of making the wood supply available to the project.

Rentech's Olympiad Project is being designed to produce approximately 23 million gallons annually of renewable and certified low-carbon RenJet fuel. The project will also produce 13 million gallons annually of renewable naphtha, a chemical feedstock.

The Olympiad Project, scheduled to be in service in 2015, will be designed as a state-of-the-art renewable energy facility that will employ the company's Rentech-ClearFuels biomass gasification system and the Rentech Process to produce the only type of alternative jet fuel certified for use in commercial aviation today. These technologies will enable Rentech to turn primarily un-marketable and underutilized timber into clean, renewable jet fuel.

Rentech is working closely with Sustainable Development Technology Canada (SDTC), whose C\$500 million NextGen Biofuels Fund (NGBF) offers a significant potential funding source for the Olympiad Project. After a year of discussions with SDTC, Rentech has recently submitted an application for funding to the NGBF, which funds up to 40 percent to a maximum of C\$200 million of eligible project development and construction costs, which would be repaid from a percentage of the project's cash flows.

A husband is a man who buys his football tickets four months in advance and waits until December 24th to do his Christmas shopping.

More than \$29 million spent with Maine businesses from wind energy construction

First Wind, an independent United States-based wind energy company, reported construction milestones and local economic benefits from the company's Rollins Wind project in Maine. Construction is nearing completion with 34 of the 40 turbines installed at the project site.

As part of the construction and development activities for Rollins Wind, more than \$29 million has been spent directly with 97 Maine-based businesses. As construction nears completion, there are still about 175 workers on the project site, but during peak construction the site supported an average of 200 jobs each day.

Matt Kearns, vice president of Northeast Business Development for First Wind, said, "When this project goes online, it will produce enough renewable energy to power nearly 23,000 Maine homes per year. It will also continue to contribute to the local economy by deliv-

ering a total of \$24 million in tax revenues to the four neighboring communities over a 30-year period while generating regional business activity through our ongoing operations on the project site."

As part of the work on Rollins Wind to date, First Wind reported the following milestones and associated economic benefits:

- \$29 million spent directly with Maine-based businesses;
- 97 Maine-based businesses have been involved in project development and construction, including 19 local businesses;
- Over 500 different contract workers have logged more than 200,000 man hours on the project site, which has averaged 200 workers during peak construction;
- In addition to the 34 of the 40 turbines already installed, significant

progress has been made on the project's necessary transmission and infrastructure including the construction of a 5,000 square-foot Operations and Maintenance building.

First Wind's Rollins project received approval from the Maine Department of Environmental Protection (DEP) on April 21, 2009. On August 6, 2009, the Board of Environmental Protection (BEP) unanimously voted in support of the DEP permit.

On October 7, 2009, the Maine Public Utilities Commission unanimously approved a 20-year long-term electricity supply contract to purchase the renewable energy generated from the Rollins Wind project. Construction of the project is expected to be substantially completed by July, with the project expected to be online sometime in August.

SPG Solar debuts Floatovoltaics generation

SPG Solar Inc.®, the company that introduced the world's first operational floating solar array in 2007, has announced the availability of its next generation floating solar technology. Redesigned and engineered to be cost competitive, SPG Solar Floatovoltaics™ makes it possible for commercial, industrial and government users with little available rooftop or land space to float solar on water, providing triple benefits: energy savings, water savings and environmental benefits. Using cost-effective floating technology, fresh water irrigation ponds,

lakes and reservoirs can become revenue-generating, power producing platforms.

When available open space is limited, Floatovoltaics provides a water-based solution. Where water is at a premium, the system offers the following conservation benefits:

- Reduces water evaporation up to 70 percent,
- Improves water quality by providing coverage from the sun that minimizes algae growth and reduces the need for harsh water treatment chemicals, and
- Provides shade below the panels, lowering the water temperature and

improving power output from the solar panels.

The Floatovoltaics power generating system works the same way as in all other solar photovoltaic (PV) installations. It is engineered for a system lifetime of 20-plus years, features no moving parts and requires limited maintenance.

Floatovoltaics technology is expected to be particularly valuable for agribusinesses, water agencies, wastewater treatment facilities, and utilities, among other applications.

Upcoming Section B editorial focus topics

ISSUE	CLOSE	FOCUS
JUL	06/17	Municipalities
AUG	07/18	Waste
SEP	08/15	Auto Recycling
OCT	09/17	Electronics
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EQUIPMENT SPOTLIGHT

Solar Energy Systems

by MARY M. COX

maryc@americanrecycler.com

In a single hour, more sunlight strikes the earth than all the energy consumed by humans in an entire year. Over 120,000 trillion kWh of energy strikes the earth every day. There are thousands of companies around the globe manufacturing products that harness that power and turn it into a viable energy source.

Marc Doyle is global business director at DuPont Photovoltaic Solutions. Dupont has more than 25 years of experience in photovoltaic (PV) materials development, applications know-how, manufacturing expertise and global market access. "Our products are key to the manufacture of both crystalline silicon and thin film solar cells and modules. They include films, resins, encapsulation sheets, flexible substrates and photovoltaic metallization, performance seals for solar cell manufacturing equipment, wet-etch additives for semiconductor texturing and metallic sodium," Doyle said.

DuPont intends to increase the efficiency and lifetime of crystalline silicon and thin film PV solar modules, and reduce overall photovoltaic system

years, and lowering overall system costs to help PV power. The solar industry is growing fast. We estimate there was 132 percent growth in 2010 versus 2009 and 20 percent growth per year over the next several years is expected.

"DuPont continues to expand R&D and manufacturing capabilities to support this trend. We've made a \$295 million dollar investment to expand production capacity for DuPont™ Tedlar® polyvinyl fluoride film, a critical material for PV back sheets, and we're doubling capacity for DuPont Solamet® photovoltaic metallization pastes."

OPEL, Inc. designs, manufactures and markets high-concentration photovoltaic panels and dual- and single-axis solar trackers for related photovoltaic and concentrated photovoltaic (CPV) systems for solar energy applications worldwide. Michael Mount, director, reported that OPEL Solar's advanced trackers increase the energy production of any type of PV panel by following the sun's path. The additional energy can be up to 45 percent more than a fixed PV installation.

Mount said, "We're a small but rapidly growing company with installations throughout Europe, North America and Asia. We develop solar power on brownfields, using OPEL Solar trackers and PV panels, as we believe that landfills provide an excellent opportunity to turn sites of limited development potential into green power projects. We're working on brownfield projects in four states."

According to Mount, the solar industry has benefited from a number of national and regional incentives which have created unprecedented industry expansion in the last few years. "Incentives have been designed to encourage development of green energy, and in particular, solar energy, but the incentives vary in amount, duration and by country and region.

"Although the industry has experienced notable expansion recently, industry growth would have expanded faster under better economic condi-

tions. A lack of energy legislation passage has also been a challenge for the solar industry. After the American Recovery and Reinvestment Act of 2009 (ARRA), there was significant progress in Congress toward clean energy legislation, but the fossil fuel lobby proved formidable; and, once again, diminished the potential of the passage of a Clean Energy Act. If a Federal Clean Energy mandate were to occur, then the solar industry might become instantly 'bankable,' and we would see spectacular growth in the industry's revenues and job creation," said Mount.

He added, "The PV industry has been focused on reducing the price of energy production to a cost at or below that of conventional generation technologies, i.e., 'grid parity.' In recent years, cost reductions have been driven by reduction in the price of PV panels, which have dropped to less than half of what they were five years ago. Equipment manufacturers also continue to provide small increases to the solar equipment efficiencies, but PV trackers can provide a superior method to greatly improve the energy production of PV systems in moving solar power costs closer to grid parity. Solar trackers have been successfully used for many years in the European solar industry but solar trackers have only recently become the standard for large utility scale projects in the United States. Large commercial projects in the States and Canada are now adding solar trackers to improve their project economics."

According to David Miller, corporate communication director, "Solyn-dra makes a unique solar panel system for large commercial and industrial rooftops composed of 40 tubes that collect light around a 360 degree surface and benefit from reflective cool roofs. Simple installation and lightweight products equals projects that are completed quickly and at a low cost."

Miller also said that their 200 Series products require no tools for installation. "The lightweight panels install without penetrations or array grounding, making this the easiest and



Solyn-dra LLC

fastest-to-install rooftop solar system yet. The product is ideal for older or 'value engineered' buildings, as the low, distributed roof load is 2.8 pounds per square foot. Snap-together mounts dramatically lower labor costs and shortens project times for large rooftop solar installations. This reduces business disruption and makes moving the system for future roofing; retrofit or ownership changes a simple process.

See SPOTLIGHT, Page 5

Manufacturer List

First Solar Inc.
Lisa Morse
602-414-9300
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OPEL Solar, Inc.
Michael Mount
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OPEL Solar, Inc.

costs so that solar power is more cost-competitive with other forms of electricity. Doyle explained that, "Key challenges where materials matter lie in raising the efficiency of solar cells and modules, extending the reliable power output of modules for 25-plus

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Landfill gas powers GM plant for new fuel-sipping cars

PHOTO BY STEVE FECHT FOR GENERAL MOTORS



Forty percent of the energy required to build the Sonic and Verano will come from burning gas from a nearby landfill. The use of the landfill gas, which saves GM \$1.1 million per year in energy costs, also cuts the amount of greenhouse gases, sulfur dioxide and nitrogen oxides released in the air.

When production of the fuel-efficient 2012 Chevrolet Sonic and Buick Verano begin this fall, 40 percent of the energy to power the General Motors (GM) Orion Assembly Plant where they are built, located in Michigan, will come from burning landfill gas created nearby.

The use of the landfill gas, which saves GM \$1.1 million per year in energy costs, also cuts the amount of greenhouse gases, sulfur dioxide and nitrogen oxides released in the air. During most of the year, the system runs exclusively on landfill gas primarily to generate steam for heating and compressed air.

“Orion is a great example of the latest technologies employed by GM manufacturing around the globe,” said Eric Stevens, GM vice president of Global Manufacturing Engineering. “As we converted the facility to support the small car program, we took every opportunity to engineer in flexibility and lean manufacturing concepts.”

Use of landfill gas is just one of the sustainable methods that lessen the plant’s environmental impact. Others include:

- Lighting system upgrades that saved more than 5,944 megawatts of electricity per year and \$430,000 while also cutting CO₂ by 3,676 metric tons. Plant workers track energy use on an hourly basis with sophisticated software, enabling them to see real-time usage by department to improve their equipment shut-down activities.

- Plant workers reduced total waste by 26 percent from 2005 to 2009.

- An upgraded paint shop is heated by natural and landfill gas, and uses half of the energy per vehicle of the one it replaced. Both the Sonic and Verano use a new eco paint that eliminates the need for a primer oven and increases quality

and appearance due to waterborne base coats.

“Environmentally friendly choices often translate to higher efficiency and quality,” said Maureen Midgley, GM executive director of Global Manufacturing Engineering. “Take our new paint shop – it was designed for optimal efficiency and delivers premium paint appearance for our vehicles.

“With these improvements, we’ll reduce greenhouse gas production by about 80,000 metric tons at a full 3-shift capacity,” Midgley said. “This is equivalent to the emissions from

14,000 vehicles per year, and the electricity reduction equals at the output from 3,500 homes.”

Some of the diverted material is directed to the cars being made. Recycled cardboard packaging from Orion and other GM plants and used denim are part of the Verano’s sound insulation.

Orion also has embraced flexible manufacturing, allowing it to quickly respond to changes in customer preferences. Production lines were re-worked, creating more space to house material onsite that once took up space in other buildings. This approach reduces the

overall environmental impact of the plant’s material systems, but it also provides significant cost savings to the overall small car program.

The 2012 turbocharged Chevrolet Sonic is a small car available in five-door and sedan models.

The 2012 Buick Verano compact sedan includes 10 standard air bags, an available heated steering wheel and a next-generation radio system with OnStar-powered connectivity.

Production of both vehicles will begin at Orion later this fall. They will be on sale by the end of the year.

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Spotlight

■Continued from Page 4

Rooftops can pose a variety of challenges for solar installations and Solyndra systems are designed specifically for the rooftop environment with superior performance in wind, with soiling and in snowy climates,” he said.

“The commercial rooftop market is a huge, untapped market that allows commercial building owners to monetize otherwise wasted assets—their rooftops. As utilities race to meet renewable energy targets, more folks are turning to rooftop solar, which provides tremendous benefits as a source of clean, distributed power. Rooftop systems go in fast and don’t require the expensive transmission network and permitting issues from solar out in the desert for example. Solyndra is committed to a green manufacturing cycle, our products are designed for the environment from start to finish and we participate in a recycling program that

ensures our products are fully recycled at end of life,” Miller said.

Suntech Power Holdings is the world’s largest producer of solar panels for residential, commercial, industrial, and utility applications. Walker E. Frost, communications manager, stated, “Our regional headquarters are located in China, Switzerland, and the United States, and we have gigawatt-scale manufacturing worldwide. Suntech has delivered more than 15,000,000 photovoltaic panels to over a thousand customers in more than 80 countries. Our pioneering R&D creates customer-centric innovations that are driving solar to grid parity against fossil fuels.”

Frost claims that Suntech continually increases module conversion efficiency while driving down the costs of production, making solar electricity affordable for everyone. “We produce high-quality, low-cost solar panels that are suitable for commercial and resi-



Suntech Power Holdings Co.

dential rooftops as well as large, utility-scale solar power plants. We recently set the world record for multi-crystalline module conversion efficiency with our advanced Pluto solar cell technology. This technology features ultra-fine top contact gridlines that boost cell power output, delivering a 10-15 percent performance advantage using the same materials and wafers as a standard cell. We expect to ship our 200 MW Pluto-powered solar panel by the end of 2011,” Frost concluded.

A very homely person made an appointment with a psychiatrist. The homely person walked into the doctor’s office and said, “Doctor, I’m so depressed and lonely. I don’t have any friends, no one will come near me, and everybody laughs at me. Can you help me accept my ugliness?”

“I’m sure I can.” the psychiatrist replied. “Just go over and lie face down on that couch.”

A Closer Look

by Donna Currie

Vexor Technology Joe Waters • 877-721-9773

Joe Waters, one of the co-owners of Vexor Technology, is pretty clear that the company is not a waste hauler. "We are a nonhazardous industrial waste processing company," he explained. Vexor picks up industrial and commercial waste, but instead of separating it for recycling or hauling it to landfills, the company uses it to make a coal-replacement fuel.

The company was founded in 1999 by Waters and the father-and-son duo of Fred and Phil Stapf. According to Waters, the three "grew up in the hazardous waste business" but they decided to use their expertise in handling and tracking hazardous materials and apply that to the nonhazardous waste business.

The three had worked together since the early 1980s. "My background was chemical," Waters said, and Phil Stapf owned a hazardous waste business. When they decided to start their own business, they were experts in the hazardous waste business, but they wanted to move into something broader but still related. "We didn't want to reinvent the wheel," Waters said. Non hazardous waste seemed to be the perfect fit.

While there is a very narrow range of hazardous waste materials, Waters said that the nonhazardous waste stream has "virtually no limitations" from dusty powdered materials to small containers of lipstick to bottles of shampoo – and all of those offer opportunities for better handling.

Waters said they decided to run the company with the "tighter best-management practices" that was required for hazardous waste. He said that while those requirements don't apply to nonhazardous waste, "generators of nonhazardous waste still have liability" and that the quality control that Vexor uses ensures the waste is handled correctly and can be tracked if necessary.

The company started with just the three owners and has since grown to 40 employees with a national scope. While much of the business is focused on the Mid-Atlantic and Northeast near the company's Ohio headquarters, there are customers in the Midwest and as far as Oregon and Texas. "It goes back to customer liability," Waters said. Once a customer sees how Vexor manages the material, they don't mind the extra transportation costs to let Vexor handle the waste from more distant operations.

While there is rail access to the plant, most of the material is handled by truck with Vexor trucks handling the outbound material, and common carriers bringing material in. The operation is on a 5.5 acre property, and all of the material is processed indoors.

The mantra for the company is "landfill avoidance and sustainability." Besides making the coal-replacement fuels, the company deals handles product recall materials that can be recycled. For example, Vexor might empty bottles of shampoo and recycle the plastic. Waters said that traditional plastic recyclers wouldn't take filled bottles, so previously a product like that would have ended up in a landfill.

But the primary focus is the waste-to-energy part of the business. Waters said that for some companies, waste-to-energy often means that the waste product simply incinerated. But at Vexor, the waste is turned into "Vexor engineered fuel," a commodity that is sold.

Waters said that the product looks a lot like mulch, but it's not meant for spreading around your flowers. The reason it's so fluffy is that the coal used in cement kilns is pulverized before use so it can be blown in. The Vexor fuel is designed to be a direct replacement for that pulverized coal, but with less environmental impact. The Vexor fuel has no mercury and less sulfur and chlorine than coal, so it produces less pollution than coal.

Unlike waste that is incinerated simply to generate power, the Vexor material is a very specific mix that mimics coal's characteristics. But that doesn't mean it's an automatic conversion for the plants that want to use it. To be able to burn any alternative fuel, plants need to have air permits and go through testing to make sure the alternative fuel burns clean enough.

Despite regulations, Waters said that he expects the waste-to-fuel market to grow "and I think it's going to grow rapidly." For cement companies, lime companies, and energy companies, "it's a big deal," he said, and he expects Vexor to be in that market. "We are a leader in the solid waste to fuel industry. We have a legitimate commodity."

Very little of what comes in to Vexor ends up in landfills, but some materials are recycled. "A lot of industrial waste comes into our plant in steel drums," Waters said. "Those are cleaned, crushed, and sent for recycling."

Waters said that one of the most satisfying parts of his job is "to be able to excite the customer about new options." Many of his customers were used to the idea that waste ended up in landfills or was incinerated. "Engineered fuel is a new and big story for them," he said.

New Jersey seeks firms to develop offshore wind power

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New Jersey has identified nearly 500 companies that could become involved in the development of wind power through the construction and assembling of turbines.

Department of Environmental Protection Commissioner Bob Martin announced that the Christie administration is issuing a formal request for firms interested in acquiring leases through the federal government for the construction of wind farms off the coast of New Jersey.

The request, known as a call for nominations, is issued through the United States Department of Interior's Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) and is the first step in the commercial renewable energy leasing process.

Responses will assist the federal agency in determining interest in a proposed leasing area encompassing 418 square nautical miles off the coast between Barnegat Light and Avalon. This leasing area begins 7 nautical miles off the shoreline and extends up to 23 nautical miles into the ocean, encompassing 43 entire federal leasing blocks and parts of 34 others.

Responses will inform BOEMRE as to competitive interest for leases, and will assist the agency in determining the next steps in the leasing process for waters off New Jersey.

In 2009, BOEMRE issued Interim Policy leases to Deepwater Wind LLC, Bluewater Wind New Jersey Energy LLC, and Fishermen's Energy of New Jersey LLC that authorize these companies to install and operate facilities to characterize wind and environmental resources. The Interim Policy leases do not authorize construction.

The leasing area was delineated in consultation with the New Jersey Energy Task Force and BOEMRE, based on extensive

environmental data collected during a two-year DEP ecological baseline study of marine and avian resources.

Under Governor Christie, the state has developed a number of proactive laws and policies to foster the development of renewable energy, including the Offshore Wind Economic Development Act, which the Governor signed into law last year.

This law authorizes creation of an Offshore Wind Renewable Energy Certificate (OREC) program and makes available financial assistance and tax credits from existing programs for businesses that construct, manufacture, assemble and provide water access facilities to support the development of qualified offshore wind projects.

The state has identified nearly 500 companies that could become involved in the development of wind power through the construction and assembling of turbines.

The OREC program calls for a percentage of electricity sold in the state to come from offshore wind energy. This percentage would be developed to support at least 1,100 megawatts of generation from qualified offshore wind projects – or enough electricity for approximately one million homes.

Secretary of the Interior Ken Salazar recently identified the area off New Jersey as a Wind Energy Area (WEA) under the "Smart from the Start" program.

As such, it is eligible for study and consultation to foster responsible and efficient leasing and development. The WEA may be adjusted pending the results of comments and information received in response to the call for nominations and through the environmental review process.

Landfill gas-to-electricity project to be largest in Georgia

EDI, Veolia Environmental Services and Energy Development, Limited, parent company of Nashville based, Energy Developments, Inc. (EDI), Green Power EMC. And Veolia ES Solid Waste, Inc., announced the expansion of EDI's landfill gas-to-electricity plant located on the Veolia ES County Landfill in Mauk, Georgia.

Renewable power generated from this facility will be sold to Green Power EMC, under a new 15 year Power Purchase Agreement.

The existing landfill gas-to-electricity facility will be expanded from the current 4 MW to 8 MW of renewable electricity capacity making it the largest

landfill gas-to-electricity facility in Georgia.

The expansion is scheduled to be completed by the end of the 2011.

Landfill gas, which is created when organic material naturally decomposes in a landfill, consists of about 50 percent methane. A reliable and readily available

local alternative to fossil fuels, landfill gas can be converted to generate electricity, heat or steam, or used as an alternative vehicle fuel.

This new 4 MW expansion will bring Green Powers portfolio of renewables to over 29 MWs.

Geothermal

■Continued from Page 1

Asmus, a senior analyst at Pike Research. "But geothermal remains an underutilized resource and represents only a small fraction of the global renewable energy portfolio."

The current installed capacity of geothermal is 10.7 gigawatts and is spread across 26 countries with a combined output of approximately 67 terawatt hours of electricity.

Currently, the United States is the world leader in geothermal with 3.1 gigawatts of installed capacity, but that only represents 0.4 percent of all domestic renewable electric generation. A miniscule amount considering that all renewable generation, including hydroelectric, only represents 10.5 percent of all American electric generation. Moreover, during the past 10 years, the growth of American geothermal has remained relatively flat with only an average annual growth rate of 1.2 percent.

This is perplexing, considering that the DOE estimates that geothermal currently produces electricity at between 5 and 10 cents per kilowatt hour. If geothermal is so clean and cheap, why is it not growing in the United States as fast as other renewable energy sources, or as quickly as it is in other countries?

Steve Hirsch, vice president of project development at Geothermal Development Associates (GDA) – based in Reno, Nevada – offered an explanation: "To a great extent it's due to the high exploration risk, long return-on-investment time period and resulting lack of investment capital. But that may be changing as a result of the tragic situation in Japan."

Hirsch was referring to the Fukushima nuclear crisis. That disaster triggered a strong response among Americans according to a major survey conducted by the Civil Society Institute one month after the earthquake cracked the reactors. Before Fukushima, nuclear energy had been gaining public support in the States, but the survey found that now a majority of Americans would freeze new nuclear power construction, stop additional federal loan guarantees for reactors, shift away from nuclear power to wind and solar power and eliminate the indemnification of the nuclear power industry from most post-disaster clean up costs.

Geothermal energy is a viable alternative to nuclear power, does not produce radioactive waste and, unlike wind and solar, it can produce energy around the clock.

GDA designs and builds complete geothermal power plants in the United States. It manufactures some of the components and orders the remaining equipment from approximately 35 other companies. "We do the design engineering, order/manufacture the components, carry out workshop tests, ship the components out in containers and then go on site to supervise the installation and commission the plant. Investment in a geothermal project carries significant exploration risk at the outset. It takes longer than oil or gas projects for investors to see profits. Most of our international projects have been for equipment supply.

"Our business is going well, but we are encountering unfair competition from companies in other countries whose governments provide subsidized export credit. The Chinese, for instance, will provide subsidized credit to the buyer. Instead of the interest rate being 9 or 10 percent; the Chinese export-import bank may offer 2 or 3 percent. Other countries, such as the French, mix export credit with foreign aid grants which results in a lower overall interest rate to the foreign buyer. It's hard for us to compete on overseas projects when our competitors are able to offer subsidized credit," said Hirsch.

In the United States geothermal development is also heating up. Saf Dhillon, who handles investor relations for U.S. Geothermal, Inc., a company that is currently developing projects in Idaho, Nevada and Oregon, said, "Traditionally Wall Street and political support has been behind wind and solar, seen as the only renewable options. Geothermal has always taken the backseat in terms of funding and subsidy support. As the markets have educated investors they have come to realize that over the long term these geothermal assets are obviously much more profitable, but they have also realized that they are very capital intensive up front."

U.S. Geothermal's business strategy has been to concentrate on proven resources in the ground rather than risk the high costs for exploration and test wells. In 2001, the U.S. Geothermal acquired Raft River in Idaho, the pilot project that DOE spent \$40 million to develop in the early 1980s in reaction to the 1979 oil crisis caused by the Iranian revolution. History has shown that when oil prices drop, investment interest in renewable energy wanes.

"Our first project to get up and running was Raft River, about five square-miles with a number of production and reinjection wells. We had a plant constructed for us by Ormat Technologies,

a 13 megawatt net plant that is now producing about 10 megawatts. It is the first plant financed and set up as a Tax Equity Partnership with Goldman Sachs utilizing Production Tax Credits (PTC). The current Administration has a combination of Investments Tax Credits along with the Department of Energy's Loan Guarantee Program. Geothermal is profitable without government incentives, but they make the return on investment that much more attractive," said Dhillon.

U.S. Geothermal now owns five geothermal assets in the United States and acquired another last year in Guatemala. "Our focus, however, is in the United States. We have two fully financed projects currently under development. San Emidio in Nevada is vendor-financed and eligible to receive a 30 percent tax credit 60 days after start-up. Neal Hot Springs in eastern Oregon is the first geothermal project to qualify under the DOE Loan Guarantee Program and is also in line to receive the 30 percent tax credit."

San Emidio is a 25 year old plant that was producing 3.5 megawatts. Using existing wells, a new plant is being built for a 9 megawatt output that will be online by the end of the year.

Neal Hot Springs is a new 23 megawatt facility under construction and expected to cost approximately \$130 million. "This is the first geothermal plant to qualify to receive the ITC and the DOE Loan Guarantee Program. DOE will provide and guarantee a low interest loan of approximately \$97 million. In addition, 60 days after the plant starts production, we will receive a check for 30 percent of the plants total capital expenditure under the Treasury Grant Program," Dhillon explained.

Geothermal projects can operate profitably in the States without government subsidies. Internationally, it appears that the federal government needs to support American geothermal technology and manufacturing jobs so American companies can compete on a level playing field. Once new geothermal projects are operational, sales contracts for electric supply to utilities run for 20 to 25 years and revenues are predictable.

Until recently, geothermal was the poor relative to wind and solar, but with continued government support it can be a growth industry for renewable, reliable power production both at home and abroad.



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