

Waste Recovery Report

recycling, reprocessing, and reusing resources

VOLUME XXXVII, Number 1

JANUARY 2012

Compositions of bales containing rigid plastic are characterized

The composition of mixed rigid plastic bales produced by different materials recovery facilities (MRFs) has been characterized in a study funded by the Association of Post Consumer Plastics Recyclers (APR). The goal was to provide information that could help in increasing the recycling of items in addition to #1 and #2 bottles. Moore Recycling Associates made and analyzed the measurements. Bales were classed in seven categories, with constituent resins in decreasing order of weight as:

- 1 All rigids – PE, PP, PET, HDPE;
- 2 Bottles and containers with no bulky rigids – PET, HDPE;
- 3 Prepicked rigids with no PET or HDPE bottles – PE, PP, HDPE;
- 4 Small containers with no PET or HDPE bottles or bulky rigids – PP, PET;
- 5 Tubs, buckets, and lids – HDPE, PP;
- 6 Bulky rigids – PE, PP;
- 7 Olefins – PP, PE.

Results also showed that contamination was minimal, the worst case being 2% in prepicked bales. For additional details, including information about obtaining the complete 77-page study, contact Steve Alexander, APR, 1001 G St NW, Suite 500 West, Washington DC 20001, 202-316-3046, www.plasticsrecycling.org.

Job impacts of various recycling and disposal schemes are examined

A new study shows that beverage container recycling has a significant net positive impact on job creation relative to disposal, with deposit systems greatly outpacing curbside collection. Commissioned by the Container Recycling Institute (CRI), the research yielded eight key findings:

- 1 Container deposit-return (CDR) creates 11 to 38 times more jobs on a ton-for-ton basis than curbside recycling;
- 2 CDR creates at least five times more jobs than disposal in landfills;

- 3 The volume of material collected is the primary driver of recycling jobs, with recovery rates more than three times greater in states with than without CDR systems.
- 4 Workers required to handle materials is the secondary driver of container recycling jobs, with CDR employing three to nine times as many people per ton collected than curbside systems.
- 5 Jobs gained in recycling far outweigh those lost in disposal, materials extraction, and processing combined.
- 6 Raising domestic polyethylene terephthalate (PET) reclamation to full capacity from the present 60% level would create 500 new jobs.
- 7 Export of PET for overseas processing costs the US 800 jobs.

For more details, including a copy of *Returning to Work: Understanding the Jobs Impacts from Different Methods of Recycling Beverage Containers* and on-line access to the MIRJCalc software developed to assist users estimate job impacts of increased recovery on a state-by-state basis, contact CRI, 4361 Keystone Ave, Culver City CA 90232-3436, 310-559-7451, www.container-recycling.org.

ISSN: 0889-0072

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Annual subscription rates, 12 monthly issues – \$60 USA & Canada, \$75 elsewhere (USF)

Make checks payable to Waste Recovery Report, ICON Inc (EIN 23-1900652)

Editor & Publisher: Alan Krigman

Website: www.wrr.icodat.com

Growth at a rate of 12% per year projected for US aluminum industry

The aluminum industry in the US is expected to expand at a compound annual growth rate (CAGR) of 12 % for the next two years. This would bring the 2013 total to about \$8 billion, despite the global economic slowdown. These positive figures, developed by RNCOS E-Services Pvt Ltd, are attributed to enhanced energy supply capacity, cost-efficient production technologies, recyclability, continuing growth in applications, and government support. **For additional information, contact RNCOS, B-29, Sector 6, Noida INDIA 201301, (US) 732-771-9006, (INDIA) +91-120-422-4700, fax +91-120-422-4707, www.rncos.com.**

Repurposing may be a viable alternative to recycling or reuse

Repurposing may be a viable alternative to recycling or reusing wastes or byproducts. According to Liz Fischer of Repurposed Materials, criteria for repurposing can be characterized by the acronym "SAVE."

- S** Standardization and uniformity of item or material properties enhances marketability.
- A** Availability on a regular basis or from multiple sources is desirable to ensure a reliable supply for downstream processing and sales.
- V** Versatility of possible applications makes items or materials more attractive.
- E** Engineering properties of items or materials may suggest viable applications.

New products have been created using a wide array of goods that might otherwise enter the disposal stream. Typical examples range from billboard vinyl coverings and mining equipment tires to street

sweeper brushes, roofing membranes and pavers, hoses, conveyor belting, and coffee bean sacks. **For more details, contact Liz Fischer, Repurposed Materials, 5138 39th Ave, Denver CO 80207, 720-583-4873, www.repurposedmaterials.com.**

On-line recycling infrastructure provider gets venture funding

eRecyclingCorps, has received \$35 MM in venture capital funding for deployment of a web-based platform to increase cell phone recycling. The system gives cell phone vendors a way to track buyers, beginning at the point of sale, in a manner that encourages trade-ins when old devices are replaced. This means of rewarding customers for recycling also provides subsidies for sellers. In addition, it offers a vehicle to ensure licensed recyclers and refurbishers with a reliable supply of phones. **For more information, contact erecyclingCorps, 909 Hidden Ridge, Suite 440, Irving TX 75038-3813, 972-573-0300, fax 972-573-0301, www.erecyclingcorps.com.**

Low-cost regenerable adsorbent captures carbon dioxide

A low-cost regenerable adsorbent based on fumed silica impregnated with polyethylenimine has been developed, which removes CO₂ from sources such as smokestacks, automobile tail pipes, and ambient air. The devices are most effective under relatively high humidity conditions. They overcome energy intensity and other problems plaguing existing devices. When the adsorbent is regenerated, the CO₂ it captures can be sequestered or released for subsequent utilization. **For more details, contact Alain Goepfert, University of Southern California, Los Angeles CA 90089, 213-740-5978, fax 213-740-5087, goepfert@usc.edu.**

Electronic waste management growing, but not rapidly enough

Electronic waste generation is expected to more than double by 2025, according to a study by Pike Research – from 676 MM to 1,465 MM ft³ and 6 MM to 14.9 MM tons. The capacity of the e-waste management industry also appears to be rising, but not fast enough to meet these anticipated demands. The analysts point out that a projected sevenfold growth in recycling and reuse activity by 2025 will still only account for 789 MM ft³ and 7.9 MM tons. Further, they say the gap will persist because of the ease with which electronic devices can be sent for landfill disposal or shipped from developed to underdeveloped regions where they are not handled responsibly. **For more information, contact Pike Research, 1320 Pearl St, Suite 300, Boulder CO 80302, 303-997-7609, www.pikeresearch.com.**

Leaching improves biofuels derived from agricultural residues

Agricultural residues are inexpensive and widely available potential sources of biofuels. However, these wastes contain relatively high concentrations of reactive alkali metals as well as chlorine, sulfur, and phosphorus – which can damage gasification or combustion chambers. The Electric Power Research Institute (EPRI) has been investigating the potential of removing these constituents by chemical leaching using alternate solvents under various conditions. The approach has been found generally successful and EPRI plans to build a pilot plant to further refine the technology. **For more information, contact Luis Cerezo, EPRI, 3420 Hillview Avenue, Palo Alto, California 94304, 800-313-3774 or 704-595-2687, www.epri.com.**

Ikea will replace wood pallets with paper and corrugated units

Ikea LLC will begin shipping products to its worldwide retail store network on pallets made of paper and corrugated cardboard. The company is investing almost \$67 MM on the project – including the initial purchase of the pallets and new or modified handling equipment. However, it expects to save \$193 MM per year on shipping costs because the new pallets are two rather than about six inches high and weigh 5.5 rather than roughly 50 lb. Capacities of the platforms to be used are approximately the same at 1,650 lb.

Paper pallets are more easily recycled than their wood counterparts. However, the former will be recycled after only one use while the latter are generally good for multiple shipments. Industry experts agree that paper may be superior to wood skids for some applications. However, they note the paper units have limitations for applications involving heavy loads or exposure to extreme weather and are unsuitable for use in supply chains where pallet pooling is desired for fast turnaround. For details, contact Ikea North America Services, 420 Alan Wood Rd, Conshohocken PA 19428-1141, 610-834-0189, www.ikea.com.

Waste group says product stewardship is a shared responsibility

Recycling and solid waste industry representatives have endorsed product stewardship as a means of increasing safe management of some items, especially those containing toxic substances, at the end of their useful lives. However, the National Solid Waste Management Association (NSWMA) has taken the position that product stewardship must

be extended to involve sharing of responsibility among governments, consumers, public and private sector recyclers and solid waste handling organizations as well as manufacturers, distributors, and retailers. Further, NSWMA cautions government entities to ensure that:

- ▶ proposed product stewardship legislation or regulations be designed to enhance environmental protection while promoting cost-effectiveness, innovation, and efficiency and avoiding or minimizing new burdens on taxpayers or consumers;
- ▶ valid, comprehensive life cycle analyses are performed and documented before products are chosen for stewardship;
- ▶ programs are implemented in a fully-competitive marketplace with no anti-trust immunity granted to stewardship organizations.

For additional information, contact Chaz Miller, NSWMA, 4301 Connecticut Ave NW, Suite 300, Washington DC 20008, 800-424-2869 or 202-244-4700, fax 202-966-4824, www.environmentalistseveryday.com.

GM recovers solvent and oil with centrifugal technology

General Motors (GM) uses sorbent pads to pick up solvent and oil from the floor of its Ft Wayne IN Chevrolet Silverado and GMC Sierra assembly plant. The fluids are recovered for reuse from the sorbent using a centrifugal technology developed by Mobile Fluid Recovery Inc (MFR). The sorbent pads can typically be utilized several times, after which they are mixed with packaging plastic and recycled into air deflectors for the vehicles. For additional information, contact MFR, 4320 Eagle Pt Pkwy, Suite A, Birmingham AL 35242, 205-453-9650, www.mobilefluidrecovery.com.

Plastic bag bans cited as using bad data to make bad policy

Cities around the country have enacted or are considering bans or other means of eliminating or reducing use of plastic shopping bags. According to H Sterling Burnett of the National Center for Policy Analysis (NCPA), “The negative impact of plastic bag litter is being overblown and the economic downside of a bag ban is being ignored... Forcing a switch to reusable bags risk[s] ... a backlash on retailers, lost jobs, and poses health hazards.”

Mr Burnett says, for example, that the proposed ban in Austin TX would be “using bad data to make bad policy.” He claims that the statistics developed by Environmental Resources Planning LLC are being misinterpreted, and actually show that only 0.6% of the city’s litter comprises plastic bags. For more details, contact a) H Sterling Burnett, NCPA, 12770 Coit Rd, Suite 800, Dallas TX 75251-1339, 972-386-6272, www.ncpa.org; b) Environmental Resources Planning, 624 Main Street, Suite B, Gaithersburg, MD 20878, 240-631-6532, www.erplanning.com.

Tire recycler may build plant in Tennessee

Wyoming Corporate Headquarters (WCH) and Tirex Corp (TCS) are planning a joint venture to build a \$7.5 MM tire recycling plant in TN. Tirex TCS-2 technology will be employed. WCH is currently negotiating with individual TN counties to collect junk tires for recycling. Annual generation in the state is estimated at 45,000 tons. For details, contact a) Brooks Stanton, WCH, 1517 Broughton St, Orangeburg SC 29115, 803-539-5025; b) John Threshie, TCS, 1771 Post Rd East, Westport CT 06880-5606, 203-292-6922, fax 203-259-8054, www.tirex-tcs.com.

Glass recycler seeks permit to operate plant in San Leandro CA

eCullet Inc has applied for a permit to start-up a glass recycling facility in San Leandro CA. It presently has plants in Oakland CA, Seattle WA, St Paul MN, and Stanley NY. The company accepts glass separated at materials recovery facilities (MRFs) from other materials collected in single-stream systems, then uses a proprietary optical technology to automate removal of contaminants and color sorting. The output, high-quality furnace-ready cullet, is sold to glass container manufacturers. **For additional information, contact eCullet, 600 Hansen Way, Suite 246, Palo Alto CA 94304, 650-493-7300, www.ecullet.com.**

Non-recyclable waste glass can remove toxic metals from water

Waste container glass unsuitable for recycling can be converted to tobermorite, a hydrated calcium silicate ion-exchange medium that can extract toxic lead and cadmium from polluted water. Naturally-occurring forms of this mineral have been found effective for treating industrial effluent and other wastewater streams as well as contaminated ground water. Nichola Coleman of the University of Greenwich has developed a relatively simple process for synthesizing tobermorite by heating ground glass, lime, and caustic soda to 100 C in sealed stainless steel vessels. The glass is the source of the silicate. The application appears to have the potential for consuming large quantities of colored glass. **For more details, contact Nichola Coleman, University of Greenwich School of Science, Central Ave, Medway Maritime, Kent ME4 4TB UK, +44-020-8331-9800, fax +44-020-8331-9805, www2.gre.ac.uk.**

Chicago area county develops recycling recommendations

Lake County, part of the Chicago metropolitan area in northeastern Illinois, established a task force in 2009 to develop plans to raise its overall recycling rate from 39 to 60% by 2020. The Solid Waste Agency of Lake County (SWALCO) has released a series of 36 recommendations which, if approved, will be implemented gradually during the next few years. Among the points are separate waste reduction targets for residences, commercial entities, and construction and demolition (C&D) projects; mandatory recycling for communities that fail to meet 2015 and 2020 waste reduction goals; an ordinance requiring C&D waste recycling to become effective in 2013; implementation of programs to process food and other organic wastes – including support of backyard composting; and pay-as-you-throw waste reduction incentives. **For more information, contact Walter Willis, SWALCO, 1311 N Estes St, Gurnee IL 60031, 847-336-9340, www.swalco.org.**

Revised county waste flow control threatens transfer station again

A 2009 ordinance enacted in Oswego County NY requiring all waste generated within the jurisdiction was invalidated in federal court in 2010. A suit brought by Jeff Holbrook of JWW Industries, operator of the county's only private waste transfer station, brought a ruling that the statute was too vague. A new version of the law has now been passed. And JWW says that its facility, which deals primarily in containers of local construction and demolition (C&D) debris picked up by the company's drivers, will

probably have to close. He claims that simply collecting the waste for delivery to the County's facility, without the subsequent sorting and recovery, isn't sustainable. According to YNN, a Syracuse NY News Channel, Mr Holbrook expected to be accommodated in the new law but was not. County officials denied targeting private business in the ordinance. **For more information, contact Jeff Holbrook, JWW Industries, 436 County Rt 51, Mexico NY 13114-4201, 315-343-7520.**

Bottle redemption center will supercede supermarket collection

A container deposit redemption center, to be operated by the Oregon Beverage Recycling Cooperative (OBRC), will open this spring in South Salem OR. The BottleDrop center will be staffed for manual transactions, although consumers with small loads will also have access to reverse vending machines.

The South Salem facility is one of several pilot locations intended to evaluate centralized redemption in areas where multiple large retailers must now run programs. Four such stores presently redeem bottles within 1.5 miles of the new BottleDrop site; another two are between 1.5 and 3 miles away. When the center is on stream, large stores within 1.5 miles will no longer accept bottles; those from 1.5 to 3 miles, along with small businesses such as gas stations and convenience shops at any distance, will have the option to redeem up to 24 containers per person. In general, bigger outlets view redemption as a cost item while small retailers welcome the business they attract along with the income they generate for handling the containers. **For details, contact OBRC, 3900 NW Yeon Ave, Portland OR 97210, 503-222-2266, fax 503-222-2291, www.obrc.com.**

Electronic waste recycling impact grew fivefold since 2002

The impact of electronic waste recycling in the US increased more than fivefold from 2002 through 2011. A study by International Data Corp (IDC), funded by the Institute of Recycling Industries (ISRI), shows the contribution of this sector to the domestic economy growing from under \$1 billion to about \$5.2 billion during the decade. Simultaneously, employment rose from 6,000 to 30,000 in private firms plus 15,000 in non-profit organizations, while throughput went from 600,000 to over 3.5 MM tons. IDC also found:

- ▶ 70% of materials collected, by weight, are processed in the US; of this, 72% is sold as commodity-grade scrap base and precious metals, plastics, and glass while 18% is marketed as components or products for reuse or refurbishment. Customers are foreign as well as domestic and the export value of the international trade is high.
- ▶ 74% of materials collected, by weight, come from business and commercial entities and 26% from household consumers, suggesting significant expansion potential among the latter.

For more information, contact a) IDC, 5 Speen St, Framingham MA 01701, 508-872-8200, www.idc.com; b) ISRI, 1615 L St NW, Suite 600, Washington DC 20036-5610, 202-662-8500, fax 202-626-0900, www.isri.org.

Refinery proposed to make gasoline from forest waste

A refinery is under development near Alexandria LA to make gasoline from forest waste at a cost that will yield an unsubsidized price at the pump around \$2 per gallon. Sundrop Fuels Inc will invest over \$450

MM in the facility, which will utilize a gasification process based on a core radiant particle reactor technology developed by and licensed through the University of Colorado at Boulder and the National Renewable Energy Laboratory (NREL). Some financing will be obtained from tax-free private-equity bonds sold by the state of Louisiana, but much is being raised from private sources, including a strategic partnership with Chesapeake Energy.

The project is expected to create 150 direct and 1,150 indirect jobs. Specifications for the installation anticipate an initial capacity of 50 MM gallons of gasoline per year. Sundrop predicts it will be able to produce over a billion gallons per year by 2020. For more details, contact Sundrop Fuels, 2410 Trade Center Ave, Suite A, Longmont CO 80503, 720-890-6501, fax 303-926-0640, www.sundropfuels.com.

Proprietary enzyme cuts waste digestion time to one day

Sealed digesters optimized to use a proprietary thermophilic enzyme convert animal and crop farming and processing wastes into pathogen-free fertilizer products in as little as 24 hours. Systems, developed by Biomax Technologies of Singapore, are already operating in Asia and the Middle East, and are slated for introduction in Australia early this year. The most common input wastes utilized to date are chicken manure and non-food residues from poultry dressing plants.

The enzyme, which activates fermentation micro-organisms, operates at temperatures high enough to destroy pathogens and also adjusts to soil pH and balances nutrients to prevent common diseases. Standard digester capacities range from two to 40 tons of waste per day. For

additional information, contact Biomax Technologies Pte Ltd, Blk 1200 Depot Rd, #03-01/02, SINGAPORE 109675, (65)-6274-8606, fax (65)-6274-8607, www.biomaxtech.com.

Foundry will add third arc furnace

ME Global Inc will add a third arc furnace to its Duluth MN foundry. The expanded capacity will cost \$12 MM and will increase the plant's job roster by 30 jobs paying an average of about \$50,000 per year. The unit, which will consume large quantities of scrap metal, is needed because the company makes replacement parts for mining equipment. These are in high demand because mines on the Mesabi range and elsewhere are operating at high capacity so the mills, crushers, and other components wear away rapidly. For more details, contact ME Global, 200 E Carterette St, Duluth MN 55808-1858, 218-626-2761, fax 218-626-3433, www.meglobal.com.

Recommendations are made to enhance packaging recovery

An analysis of packaging materials recovery systems across the world has yielded recommendations for system and practice improvements suitable for implementation in the US. These include:

- ▶ Harmonizing standards on a national rather than a local basis.
- ▶ Adoption of four- or five-bin collection systems.
- ▶ Greater investment in sorting technologies.
- ▶ More extended producer responsibility requirements.

For additional information or a copy of *Closing the Loop: Road Map for Effective Material Value Recovery*, contact GreenBlue, 600 East Water St, Suite C, Charlottesville VA 22902, 434-817-1424, fax 434-817-1425, www.greenblue.org.

Transfer station upgrades supercede mandatory recycling

Plumas County CA presently has a voluntary trash pickup system. Residents can decide whether or not to get weekly service – at \$25.71 per month. When the contractor, Feather River Disposal, offered to give the County the \$111,000 excess over its guaranteed profit, a pilot project was proposed under which trash and recyclables would be collected at the curb, but participation would become mandatory. This would add about 2,000 households to the roster and \$26.31 per month to the price.

The County Board of Supervisors believes mandatory recycling will eventually be needed to meet the state's 2020 rate targets. However, objections from residents who do not now use the trash service caused the Board to rescind the pilot project for now. Instead, it is considering use of the \$111,000 to upgrade its transfer stations and recycling centers. Some interest has been shown in curbside recycling for future implementation, but sentiment favors a pilot program that is more local in scope and voluntary. For further information, contact Bob Perreault, Plumas County Dept of Public Works, 1834 E Main St, Quincy CA 95971, 530-283-6268, fax 530-283-6323, www.plumascounty.us.

Newly-formed recycling firm builds its network by acquisition

ReCommunity, a company formed in 2011 through the purchase of 23 non-core recycling assets of Casella Waste Systems, has grown to 35 facilities by acquiring Hudson Baylor Corp. ReCommunity's network now extends to 12 states in the Northeast, Mid-Atlantic, and Southwest; it comprises 30 materials re-

covery facilities (MRFs), four transfer stations, and a glass processing plant – having a combined capacity of about 1.8 MM tons per year and a workforce numbering roughly 1,150. Another two facilities are scheduled to be added during 2012. For further details, contact a) Jim Bohlig, ReCommunity, 809 West Hill St, Charlotte NC 28208, 704-697-2000, fax 704-472-3775, www.recommunity.com; b) Scott Tenney, Hudson Baylor, 237 Dupont Ave, Newburgh NY 12550, 845-561-0160, www.hudsonbaylor.com.

Administrator named for certifying compostable plastics

NSF International has been selected to administer the third party certification of compostability for biodegradable plastics. The program was developed and is run by the Biodegradable Products Institute (BPI). It is based on a methodology established by the American Society of Testing and Materials (ASTM) to verify that products will decompose in municipal or commercial composting systems without leaving toxic substances or residual plastics.

NSF was accredited in 2010 to perform the tests for BPI. It will now



take on administrative responsibilities for the certifications – from handling initial applications and product reviews to verifying compliance with BPI program requirements. BPI will continue to handle the licensing of its compostability logo. For more information, contact a) Steven Mojo, BPI, 331 W 57th St, Suite 415, New York NY 10019, 888-274-5646, www.bpiworld.org; b) Tom Bruursema, NSF, 789 Dixboro Rd, Ann Arbor MI 48105, 800-673-6275 or 734-769-8010, fax 734-769-0109, www.nsf.org.

British utility uses coded water to deter metal theft

Thames Water Utilities Ltd is tagging cable, gratings, and other metal items at worksites and along its networks by daubing or spraying them with a chemically-based coding solution. The medium, produced by Smartwater Technology Ltd, is a solution of water and an additive formulated to have a unique chemical code that acts as a forensic signature. The code, which can be read under ultraviolet light, helps scrap dealers and law enforcement officers identify the origin of stolen goods. At key sites, Thames also uses sprayers triggered like burglar alarms. The spray is undetectable under normal conditions, cannot be washed off, and persists for extended periods, so thieves carry evidence of their crimes with them. To ensure that coding is unique and traceable, the forensic fluid – *Smartwater* – is licensed rather than sold. For details, contact Bob Collington, Thames Water Utilities Ltd, Clearwater Ct, Vastern Rd, Reading RG1 8DB UK, +44-0-845-920-0887, www.thameswater.co.uk; b) Phil Cleary, Smartwater Technologies Ltd, Box 136, Telford TF3 3WY UK, +44-0-870-242-8899, www.smartwater.com.

Waste-to-energy plant will run on C&D debris

A waste-to-energy plant under construction in Plainfield CT will be fueled by waste wood obtained from construction and demolition (C&D) projects, old pallets, land clearing, and similar sources. The \$225 MM facility, based on a fluidized bed gasification technology, will generate 37.5 MW for sale to Connecticut Light & Power. For more information, contact Plainfield Renewable Energy LLC, 103 N Park Ave, Easton CT 06612-1416, 203-450-9644.