

Greenlist Bulletin

From the Toxics Use Reduction Institute
at the University of Massachusetts Lowell

December 13, 2013

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This is the weekly bulletin of the TURI Library at the University of Massachusetts Lowell. Greenlist Bulletin provides previews of recent publications and websites relevant to reducing the use of toxic chemicals by industries, businesses, communities, individuals and government. You are welcome to send a message to mary@turi.org if you would like more information on any of the articles listed here, or if this email is not displaying properly.



Green chemistry awards: soybean coolant, eco-friendlier house paint, vegan leather

[Source: Environmental Health News, December 13, 2013](#)

Author: Lindsey Konkkel

A coolant made from soybean oil and a more eco-friendly white paint are two winners of the 2013 Presidential Green Chemistry Challenge Awards announced this week.

The U.S. Environmental Protection Agency honored five innovative technologies that made important breakthroughs in becoming safer, cleaner and more sustainable.

Over recent decades, industries have relied on many compounds and manufacturing techniques that are toxic, consume resources, or threaten the environment. The goal of green chemistry is to develop new technologies that are not only more environmentally friendly, but commercially viable.

The awards recognize companies and technologies "not just because they have great potential, but because they have shown they can achieve that potential," said Jim Jones, EPA Assistant Administrator for Chemical Safety and Pollution Prevention.

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Conversion of Plating Line Rinses to a Closed-Loop Deionization System

[Source: Metal Finishing, January 2, 2012](#)

Author: Dave Fister

Background. An upstate New York manufacturing company (Company XYZ) has a captive plating shop with hard chrome, black oxide, and copper plating processes.

The chrome, copper and black oxide plating lines all have rinse tanks to remove any heavy metal residue or other chemicals as parts move from tank to tank. Since regulatory requirements limit the amount of dissolved heavy metals and other effluents that can be released into the sewer system, Company XYZ also has in-house wastewater treatment capabilities to remove dissolved metal from their rinse water. Their method for accomplishing wastewater treatment was changed dramatically in early 2011, resulting in plating process improvements and electricity reductions.

Overview. Company XYZ worked in collaboration with NYSP2I (New York State Pollution Prevention Institute) on a Lean, Energy & Environment assessment which resulted in an opportunity to convert their rinse waste processing in their plating lines and chrome exhaust scrubber. This consisted of eliminating the existing electro-precipitation process and moving to a reverse osmosis, deionization system (RO-DI). The results were consistently cleaner rinse water, reduced electricity use, and reduced maintenance on the chrome exhaust scrubber. The annual electricity savings, scrubber maintenance savings, [and] added cost of resin column generation resulted in a net annual savings of \$21,627 with an expected simple payback of 2.5 years (after the NYSERDA capital rebate of \$25,000). Total capital cost, including new equipment purchase and old equipment removal, was approximately \$80,000.

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Tapping Hidden Energy In Organic Waste

Source: [BioCycle, September 2013](#)

Authors: Patrick Serfass and Nora Goldstein

Kenneth L. Kimmell was appointed in January 2011 as Commissioner of the Massachusetts Department of Environmental Protection (MassDEP). Since his appointment, MassDEP has launched a clean energy program to focus on the permitting and siting of renewable energy facilities, such as anaerobic digesters. The Department also is getting set to enact a ban on disposal of commercial organics. The American Biogas Council (ABC), along with BioCycle, interviewed Commissioner Kimmell about the current and future opportunities for renewable energy from organics recycling in Massachusetts.

ABC: In October, at the BioCycle 13th Annual Conference on Renewable Energy From Organics Recycling (REFOR13), you're planning to speak about the "Hidden Energy Value of Organic Waste." Why is this topic important to you?

KIMMELL: A number of different drivers are behind Massachusetts' effort to tap into the hidden value of organic waste. First, as a state that has always pushed for the highest recycling and reuse of materials, we have found in recent years that those rates have plateaued. Therefore, the first driver is looking for new ways to beneficially use materials in the waste stream. Second, landfill capacity is shrinking in Massachusetts, and there is a lack of enthusiasm by communities to either expand or site new landfills. As this capacity dwindles, more of the waste generated in Massachusetts is being exported out of state for disposal, and this is not a good economic or environmental strategy. Third are the climate change aspects. We don't believe throwing food waste into the landfill where it releases methane is good carbon policy. Finally, Governor Deval Patrick has been a champion of clean renewable energy. Solar and wind energy have increased dramatically in Massachusetts since he took office in 2007. For a state that is at the end of the pipeline for gas and other fuels, having energy independence is very good for the local economy.

[Read more ...](#)

See resources from MassDEP on [Composting & Organics](#) and on [Anaerobic Digestion & Organics Diversion](#).

Also read this June 2013 guide from the MassDEP, ["Reducing Food Waste: A How To Guide for Businesses and Institutions."](#)

Toxic chemicals: The unwanted gifts that keep on giving

Source: [Environmental Defense Fund, December 12, 2013](#)

Author: Rachel Shaffer

There's a lot to think about in preparation for the wonderful family gatherings, delicious food, gift-

giving and festivities that come with the holiday season. For the holiday meal, I need to consider all of the different dietary restrictions so I don't leave out my vegetarian and gluten-free relatives. But I need to shop even more carefully to try to avoid the dizzying number of preservatives, chemicals, and pesticides in food products that may be dangerous to my health.

And picking out that perfect present can also be stressful; I need to make sure that the new toy that I bought for my baby cousin doesn't contain unwanted, harmful chemicals. . . .

Taking personal steps to reduce or eliminate chemicals from my life sometimes seems a losing battle. I feel like I'm playing whack-a-mole: Even if I am successful in avoiding chemicals from certain products, there are countless others in my home or at my office that may be dangerous as well.

Despite the self-reliant attitude of many Americans, this is not a problem we can solve on our own. . . . We need a national policy that ensures chemicals on the market are safe, instead of the current system that allows dangerous or untested chemicals to stay on the shelves and makes it our individual responsibilities to try to ferret them out.

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Triclosan Exposure Increases Triclosan Resistance and Influences Taxonomic Composition of Benthic Bacterial Communities

Source: [Environmental Science & Technology](#), July 18, 2013

Authors: Bradley Drury, John Scott, Emma J. Rosi-Marshall, and John J. Kelly

Triclosan (TCS) is a broad-spectrum antimicrobial compound that is incorporated into numerous consumer products. TCS has been detected in aquatic ecosystems across the U.S., raising concern about its potential ecological effects. We conducted a field survey and an artificial stream experiment to assess effects of TCS on benthic bacterial communities. Field sampling indicated that TCS concentrations in stream sediments increased with degree of urbanization. There was significant correlation between sediment TCS concentration and the proportion of cultivable benthic bacteria that were resistant to TCS, demonstrating that the levels of TCS present in these streams was affecting the native communities. An artificial stream experiment confirmed that TCS exposure could trigger increases in TCS resistance within cultivable benthic bacteria, and pyrosequencing analysis indicated that TCS resulted in decreased benthic bacterial diversity and shifts in bacterial community composition. One notable change was a 6-fold increase in the relative abundance of cyanobacterial sequences and a dramatic die-off of algae within the artificial streams. Selection of cyanobacteria over algae could have significant implications for higher trophic levels within streams. Finally, there were no observed effects of TCS on bacterial abundance or respiration rates, suggesting that bacterial density and function were highly resilient to TCS exposure.

[Read more...](#)

Read, from Safer Chemicals/Healthy Families, "[FDA agrees to set regulation on toxic triclosan.](#)"

See from the U.S. FDA, [Triclosan: What Consumers Should Know](#), and a [fact sheet on Triclosan](#) from Food & Water Watch and Beyond Pesticides.

Circulating levels of perfluoroalkyl substances and prevalent diabetes in the elderly

Source: [Diabetologia](#), November 12, 2013

Authors: Lars Lind, Björn Zethelius, Samira Salihovic, Bert van Bavel and P. Monica Lind

Aims/hypothesis. Several environmental contaminants, such as polychlorinated biphenyls, dioxins, bisphenol A and phthalates, have been linked to diabetes. We therefore investigated whether other kinds of contaminants, perfluoroalkyl substances (PFAS), also called perfluorinated compounds (PFCs), are also associated with diabetes.

Methods. The Prospective Investigation of the Vasculature in Uppsala Seniors (PIVUS) study investigated 1,016 men and women aged 70 years. Seven PFAS were detected in almost all participant sera by ultra-high performance liquid chromatograph/tandem mass spectrometry. Diabetes was defined as use of hypoglycaemic agents or fasting glucose >7.0 mmol/l.

Results. 114 people had diabetes. In the linear analysis, no significant relationships were seen between the seven PFAS and prevalent diabetes. However, inclusion of the quadratic terms of the PFAS revealed a significant non-linear relationship between perfluorononanoic acid (PFNA) and

diabetes, even after adjusting for multiple confounders (OR 1.96, 95% CI 1.19, 3.22, $p=0.008$ for the linear term and OR 1.25, 95% CI 1.08, 1.44, $p=0.002$ for the quadratic term). Perfluorooctanoic acid (PFOA) also showed such a relationship ($p=0.01$). PFOA was related to the proinsulin/insulin ratio (a marker of insulin secretion), but none of the PFAS was related to the HOMA-IR (a marker of insulin resistance) following adjustment for multiple confounders.

Conclusions/interpretation. PFNA was related to prevalent diabetes in a non-monotonic fashion in this cross-sectional study, supporting the view that this perfluoroalkyl substance might influence glucose metabolism in humans at the level of exposure seen in the general elderly population.

[Read more \(PDF\) ...](#)

Also read this week's press release from Uppsala University about this study, "[New study shows link between perfluorinated compounds and diabetes.](#)"

See also, from *Environmental Science and Technology*, "[Occurrence of Perfluorinated Compounds in Raw Water from New Jersey Public Drinking Water Systems](#)" and from *Toxicologic Pathology*, "[Immunotoxicity of Perfluorinated Compounds: Recent Developments.](#)"

Can We Turn Unwanted Carbon Dioxide Into Electricity?

[Source: The Ohio State University, December 12, 2013](#)

Author: Pam Frost Gorder

SAN FRANCISCO -- Researchers are developing a new kind of geothermal power plant that will lock away unwanted carbon dioxide (CO₂) underground -- and use it as a tool to boost electric power generation by at least 10 times compared to existing geothermal energy approaches.

The technology to implement this design already exists in different industries, so the researchers are optimistic that their new approach could expand the use of geothermal energy in the U.S. far beyond the handful of states that can take advantage of it now.

At the American Geophysical Union meeting on Friday, Dec. 13, the research team debuted an expanded version of the design, along with a computer animated movie that merges advances in science with design and cognitive learning techniques to explain the role that energy technologies can have in addressing climate change.

The new power plant design resembles a cross between a typical geothermal power plant and the Large Hadron Collider: It features a series of concentric rings of horizontal wells deep underground. Inside those rings, CO₂, nitrogen and water circulate separately to draw heat from below ground up to the surface, where the heat can be used to turn turbines and generate electricity.

[Read more ...](#)

Read from *MIT Technology Review*, "[If We Can Bury Carbon Dioxide, Why Not Use It to Make Electricity?](#)"

Also read from the University of Minnesota, "[Geothermal Power Generation from Carbon Dioxide Sequestration Uses Renewable Resources.](#)"

Could Your Home or Office Give You Asthma?

[Source: EcoBuilding Pulse, December 12, 2013](#)

Author: Katie Weeks

Could buildings -- or, more specifically, the interior finishes in buildings -- increase our risk for developing asthma? A new study from the Healthy Building Network (HBN) asserts that asthma-causing chemicals, or asthmagens, are pervasive in building materials, and that reducing or eliminating these chemicals could improve asthma prevention strategies, reducing the rate of chronic asthma.

How, exactly, is this connected to buildings? The report, "Full Disclosure Required: A Strategy to Prevent Asthma Through Building Product Selection," asserts that building materials can lead to indoor environmental conditions that "can lead to the development of asthma through exposures [to asthmagens] ... and can trigger asthma attacks for those who already have the disease."

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How to make pollution-prevention systems work for your company

Source: [GreenBiz.com, December 10, 2013](#)

Author: Cam Metcalf

During P2 Week 2013, the National Pollution Prevention Roundtable promoted a Pollution Prevention (P2) Pioneer Webinar targeting state technical assistance programs (TAPs) and industry EHS staff. The webinar featured P2 pioneers Cindy McComas, Gary Hunt and Cam Metcalf, who shared their years of experience and thoughts on the evolution of P2.

They discussed the evolution perspectives from an end-of-pipe reactive mode to a production process approach and finally, to a proactive systems model. P2 has grown over the years, and it's now in the "environmental sustainability" phase. Good plans are in place, but upper management commitment is essential for the approaches to succeed. . . .

The evolution of successful P2 plans and programs has been a process of finding new ways for organizations to move from creating P2 awareness to promoting action plans through a systems approach process. Systems approaches already are used for creating processes relating to economics, energy, environment, innovation and quality. The EPA's current Lean, Energy, Environmental Management Systems (EMSs) and Green Chemistry programs are examples of using a systems model to create innovative and effective approaches to reduce pollutants and encourage P2.

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Cancer Study Backs Silica Plan

Source: [PaintSquare, December 13, 2013](#)

Millions of American workers, including abrasive blasters and construction laborers, could benefit from a federal proposal to limit silica exposure on the job, concludes a new study published by the American Cancer Society.

The health benefits of lower permissible exposure limits on silica in the workplace are one of several key developments highlighted in "Silica: A Lung Carcinogen," newly published in the society's *CA: A Cancer Journal for Clinicians*.

"New studies have also shown that excess lung mortality occurs in silica-exposed workers who do not have silicosis and who do not smoke," says the article, by Kyle Steenland, PhD, and Elizabeth Ward, PhD.

[Read more...](#)

Access article in *CA: A Cancer Journal for Clinicians*, "[Silica: A Lung Carcinogen](#)."

Please send a message to mary@turi.org if you would like more information on any of these resources. Also, please tell us what topics you are particularly interested in monitoring, and who else should see Greenlist. An online search of the TURI Library catalog can be done at <http://library.turi.org> for greater topic coverage.

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