



ENVIRONMENTAL SYSTEMS DIVISION NEWSLETTER

01 MARCH 2020

This ESD Newsletter is a monthly enterprise involving ALL members of ESD. ESD Members are encouraged to forward materials, authored papers for publishing on Environmental Engineering topics, and comments on newsletter topics or current events to the Editor. Your participation in submitting materials for the newsletter is greatly appreciated.

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1. ENVIRONMENTAL TECHNOLOGIES

Packing a sustainable punch: how Europe is forming a new relationship with plastic

Business Planet heads to Austria to see how one large family firm is attempting to turn the problem of plastic pollution from packaging into a sustainable business opportunity. Today's modern economy would not function without plastic, but the waste it generates has created a public backlash because of concerns over its environmental impact. Innovative ways of producing, reusing and recycling plastic are therefore needed if we are to change our relationship with this essential material. ALPLA is a major converter and recycler of plastics. A global leader, the Austrian company is committed to developing innovative sustainable packaging systems. One of its core products is a bottle made from so-called PET, (polyethylene terephthalate) already recycled plastic that can be used again and again. "The



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great thing about PET is, that it's easy to recycle and can be used repeatedly in closed loops. Production of this recycled material results in about 90 percent less CO₂ emissions. The firm has teamed up with a number of other businesses, including NOM, an Austrian dairy company which uses ALPLA's 100 percent recycled PET (rPET) bottles for its milk products. Unlike many other dairies, which are reintroducing glass bottles, NÖM made the deliberate decision to use plastic. Compared to the refillable glass bottle, they save 20 percent CO₂ in total and would need 23 times more trucks to transport the same amount of bottles than with the PET bottle. Plastic's strength, notably its protective qualities and durability, have from an ecological perspective arguably become a weakness. It is for that reason why circular solutions, which enable plastic to be repeatedly recycled, are vital. (Ref. 1) [Back to Newsletter's Page 1](#)

The United States has a colossal e-waste problem. This is why

E-waste in the United States is out of control. If that line reads like clickbait for a Chicken Little podcast, consider that most states don't really know what's happening to the majority of the electronics getting tossed or recycled. One may assume America has to at least be on par with the rest of the first world when finding a forever home for computers, phones, and printers, but it be wrong. Those millions of old motherboards and TVs consoles rotting in landfills and warehouses aren't just eyesores. They amount to a massive health hazard. While electronics waste comprises only 2-3 percent of America's solid waste stream, the lead, cadmium, chromium, and other materials in aging circuitry account for 70 percent of the hazardous material in landfills, according to an EPA report. The electronics recycling industry also needs to be checked more carefully. Many seemingly legit scrap haulers may have green leaves slapped on the side of their trucks and advertise environmentally friendly solutions while still dumping their stockpiles in landfills or overseas. Others go belly up, leaving behind millions of pounds of old gadgets piled in mountainous heaps atop land which has lead levels many times normal. Maybe it's easy to ignore the huge percentage of vintage gadgets that wind up torched in dicey scrap heaps in developing countries. The reasons for the current state of e-waste removal and recycling are complex, yet not impossible to address. Some factions hold more blame than others. Still, there's plenty of responsibility to share, beginning with a large pool of consumers who expect to update their mobile phones about every two years. This list of reasons isn't exhaustive, but serves as a solid starting point for understanding the United States' e-waste dilemma and what can be done. (Ref. 2) [Back to Newsletter's Page 1](#)

2. ENVIRONMENTAL REGULATIONS

New Jersey DEP Adopts New Storm Water Amendments

The New Jersey Department of Environmental Protection (DEP) formally adopted groundbreaking amendments to New Jersey's storm water management rules. The rules will better protect water quality by reducing polluted runoff through implementation of green



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infrastructure technologies. This also helps to make New Jersey more resilient to storm and flood impacts from climate change. The amendments emphasize how engineering with nature and focusing on green infrastructure strategies can be more effective at managing polluted runoff and reducing flooding. These amendments, resulting from extensive discussions with stakeholders and experts, mark a milestone in how New Jersey manages and regulates storm water. The DEP is working with stakeholders on additional storm water management rule changes to even further advance Governor's commitment to protecting the environment and making the state more resilient to the impacts of climate change. There is also the requirement for permit applicants to use green infrastructure to reduce storm water runoff and to achieve water quality goals. The amendments also redefine the types of surfaces subject to the rules and changes. This intends to better support water quality-protection efforts in urban communities with combined sewer systems and will take effect in one year. As the most densely populated state, New Jersey must remain proactive and open to better ways to manage storm water. (Ref. 3) [Back to Newsletter's Page 1](#)

ExxonMobil proposes framework for industry-wide methane regulations

ExxonMobil Corp. released a model framework for industry-wide methane regulations and urged stakeholders, policymakers and governments to develop comprehensive, enhanced rules to reduce emissions in all phases of production. ExxonMobil has been applying the principles of this framework to our oil and natural gas operations for several years, resulting in improvements that demonstrate what's practicable and achievable. The ExxonMobil model framework is based on its voluntary methane reduction program, which involves prioritized replacement of components with a high-leak potential at production sites, technology enhancements to infrastructure and substantial data gathering and research. More comprehensive than current federal rules, the proposed regulations would apply to new and existing sources. The company has reduced methane emissions from its U.S. unconventional operations by 20 percent since 2016 and remains on track to reach its target of 15 percent reductions across the company. To achieve meaningful reductions in methane emissions, regulations should address and include four primary requirements: Leak detection and repair programs across oil and gas infrastructure, Minimization of venting, Operational equipment controls, and Record keeping and reporting to support agency enforcement. ExxonMobil supports the Methane Guiding Principles for reducing methane emissions across the natural gas value chain, which were signed in 2017. The guiding principles are being implemented in collaboration with many stakeholders, including the Environmental Defense Fund, the International Energy Agency, the International Gas Union, the Oil and Gas Climate Initiative Climate Investment Fund, the Rocky Mountain Institute, the Sustainable Gas Institute, the Energy and Resources Institute and United Nations Environment. (Ref. 4) [Back to Newsletter's Page 1](#)

3. ESD CHAIRMAN/DIVISION NEWS



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ESD Technical Representative to WIE Planning Committee

Why: The Environmental Systems Division (ESD), in conjunction with the ASME Materials and Energy Recovery Division, the ASME Research Committee on Energy, Environment and Waste, and the Air and Waste Management Association (A&WMA) are planning a Waste Information Exchange (WIE) in the Washington, DC area. The WIE will be based on the [Air] Information Exchange held annually in North Carolina. The main presentations will be by EPA personnel.

How: ESD is looking for a volunteer to be the ESD Technical Representative to the Planning Committee. The individual should be familiar with the RCRA/HSWA regulatory program (including guidance and compliance/enforcement issues) on both solid and hazardous waste. Contacts in the Office of Resource Conservation and Recovery (ORCR) in DC would be a plus. Most of the work will be by telephone or electronic mail.

Submit Nominations: please contact Arnie Feldman at jjdsenv@att.net or Ryan Neil, ESD Chair, at ryanneil84@hotmail.com

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ICEM 2021 ANNOUNCEMENT

ASME, the Nuclear Engineering and the Environmental Systems Divisions, are pleased to announce the return of the International Conference on Radioactive Waste Management and Environmental Remediation (ICEM). The Conference is set for Oct 10-13, 2021, in Stuttgart, Germany. As with past, ICEM's the Conference will feature Plenary and Luncheon speakers, breakout sessions and a large exhibit hall suitable for equipment displays for radioactive D/D&D tasks. The breakout sessions will feature panel discussions, invited speakers, articles, and presentations, as well as peer-reviewed papers.

The Tracks for ICEM 2021 include:

Track 1 Robotics and Remote Handling and Viewing Technologies

Track 2: Facility Decommissioning, Decontamination & Demolition (D/D&D) Overall (Plan, Decommissioning, Demolition, R&D)

Track 3: Major facilities experience in handling accidents and D/D&D

Track 4. Spent Fuel, Fissile Material, TRU, and HLW Management:

Track 5. L/ILW Radioactive Waste Management:

Track 6. Environmental Remediation (ER) including Activities at NORM/TENORM Sites

Track 7. Special Topics 1 - Public Involvement/ Crosscutting Issues/Global Partnering/Human Resource Development

Track 8. Special Topics 2 - New Facility Planning/ Environmental Management (EM)/ Health & Safety

Track 9. Student/Young Engineers Program

Track 10. D/D&D Research & Development Activities

If you are interested in being a Track Chair, a Session Chair, or helping to develop the conference, please do not hesitate to contact Arnie Feldman (jjdsenv@att.net) or Bob Stakenboroghs (bob@evisive.com). **[Back to Newsletter's Page 1](#)**

4. EDITORIAL BOARD SELECTIONS

Sustainability Snapshot: Making Practical Progress

In their own words, sustainability leaders from the chemical process industries provide insight about their practical success and ongoing goals in improving environmental performance. Considerations about environmental sustainability are permeating all levels of the global economy, as companies realize that change is necessary for the resilience of their businesses, as well as society as a whole. Indeed, the activities of the chemical process industries (CPI) have traditionally involved the consumption of non-renewable resources and in many cases, the generation of large amounts of atmospheric emissions, but the materials produced by the CPI are also essential to countless products across global supply chains. The adoption of sustainable practices is not simply a compulsory action dictated by government regulations — the transition to more sustainable manufacturing models is complex, and also opens the door for paradigm-shifting innovation in the CPI and beyond.



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The sustainability momentum is continuing to build, but that in many cases, the steps being taken in the CPI are self-initiated and somewhat independent. However, as the sustainability interests of consumers, manufacturers and regulatory bodies coalesce, the transition will rapidly accelerate. Growing consumer and media attention, coupled with new regulatory drivers, are prompting companies to take a closer look at how the drive for a more circular economy may impact their strategy. With the right support, collaboration, incentives and adjustment to consumer demands and expectations, the industry will be capable of much more to support global sustainability and the development of a real circular economy in the years ahead. (Ref. 5) **[Back to Newsletter's Page 1](#)**

Pesticides increase the risk of schistosomiasis, a tropical disease

Schistosomiasis is a severe infectious disease caused by parasitic worms. As an intermediate host, freshwater snails play a central role in the life cycle of the parasite. In a recent study published in the journal *Scientific Reports*, researchers from the Helmholtz Centre for Environmental Research (UFZ) in cooperation with the Kenya-based International Centre of Insect Physiology and Ecology (icipe) succeeded in proving that snail populations in waterbodies contaminated with pesticides were significantly larger than in uncontaminated waterbodies. The pesticides used in agriculture may well be an outright driver for the risk of infection with schistosomiasis, the researchers warn. According to WHO estimates, there are around 200 to 300 million people infected with schistosomiasis (also known as bilharzia) worldwide; around 200,000 die each year of the consequences. The disease also has far-reaching socio-economic effects in the tropical regions concerned: infected individuals are often unable to work and children are too weak to be able to go to school. It is transmitted through the skin following exposure to infected water. The pathogen is a parasitic trematode worm of the genus *Schistosoma*—the "blood fluke". To date, five different kinds of *Schistosoma* that can infest humans have been identified. (Ref. 6) **[Back to Newsletter's Page 1](#)**

Natural pesticides: The next breakthrough in the global food industry?

Chemical pesticides have been an accepted part of the global food industry for decades. Since being introduced in the 1970s by Monsanto, products containing glyphosate have helped increase and secure the global food supply through widespread use. The chemical has become so indispensable to the industry that removing it from the agriculture system could potentially undernourish large populations. However, recent news such as reports from The National Center for Biotechnology Information that links traces of glyphosate to cancer and generate concern over how the chemical accumulates in the air, soil and water supply, has increased pressure among the government to find alternatives to the chemical, and potentially ban its use altogether. This increased pressure may result in glyphosate's removal from multiple markets without an alternative ready to replace its weed-killing properties. France and Germany have plans in motion to ban all glyphosate use by 2021 and 2023, and others will likely soon follow suit. Given the fact that many of these brands are in the process of developing natural alternatives but remain in the testing phase, mass bans have the potential to negatively impact the agricultural community and crop supply sooner



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than we anticipated. While natural pesticides are considered more effective and don't leave trace amounts of chemicals in the product, it could take years to fill the demand for an alternative in the market. (Ref. 7). [Back to Newsletter's Page 1](#)

Epigenetics: A New Plant Breeding Technology

New plant breeding technologies (NBTs) are a group of techniques which encompass a wide variety of approaches, methodologies and unique characteristics to develop new varieties. They may either be used alone in the breeding process or they may be used in combination with other NBTs, conventional breeding approaches or with genetically modified (GM) technologies. NBTs usually allow for the development of new varieties in a faster and more precise manner than conventional breeding techniques. Traditional wisdom teaches that DNA is the foundation of heredity. A single letter change in this code can lead to genetic changes. The nucleotide cytosine (the C in the genetic code) can be changed into a methylcytosine. The best-known epigenetic process is DNA methylation. This is the addition or removal of a methyl group (CH₃), predominantly where cytosine bases occur consecutively. Another significant epigenetic process is chromatin modification. Many other types of epigenetic processes have been identified. Additional epigenetic mechanisms and considerations are likely to surface as work proceeds. Sound Agriculture is one of a group of emerging companies that are using a life science approach to discovery that combines molecular biology with modern computational power, resulting in an entirely new understanding of plant and microbe interactions. (Ref. 8) [Back to Newsletter's Page 1](#)

How the Impossible Burger is changing the debate over GMO foods

Impossible Foods has claimed a spot on the menus of fast-food chains like Restaurant Brands International's Burger King and White Castle, making it a major player in the growing alternative meat market. One thing separating it from the crowd: GMOs. Unlike its biggest competitor Beyond Meat, which touts Non-GMO Project verification for all its plant-based proteins, Impossible Foods uses multiple genetically modified ingredients. As more restaurants begin to sell Impossible Burgers, anti-GMO organizations are worried they're moving in the wrong direction — both for the environment and for public health. Since Impossible Foods first debuted in restaurants, advocacy groups including the Center for Food Safety, Non-GMO Project and Friends of the Earth all have raised concerns with the available research on its products' ingredients. Impossible Foods has written extensively on its use of genetic engineering, stating that its products' safety is backed up by numerous scientific experiments and calling some voices of opposition "anti-science. In addition to GMO soy protein, one of Impossible Foods' key ingredients is heme, a molecule the company says makes its burger "bleed" and taste like real meat. While the company initially extracted it from the root nodules of non-GMO soybean plants, it needed a more efficient method to meet high consumer demand. Enter soy leghemoglobin, short for legume hemoglobin, a genetically engineered protein made by splicing soybean DNA into yeast, which is then fermented. The new process allowed the company to ramp up production without destroying millions of soybean plants. (Ref. 9) [Back to Newsletter's Page 1](#)



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Paper or Plastic: Why This Should No Longer be an Option

Across the United States, local governments and state legislatures have focused their efforts on reducing and/or eliminating the use of plastic bags at grocery stores and other businesses. Such a reduction is significant to reducing harmful impacts suffered in oceans, lakes, rivers, forests, and other natural habitats for creatures. Furthermore, the implementation of regulations and bans prohibiting the use and sale of plastic bags focuses on improvements in recycling efforts, which is aimed to increase awareness of the negative side effects of the prevalent use of plastic bags. In response to the significant impact the use of plastic bags has on the global environment, eight states have banned single-use plastic bags. Beginning in 1991, Maine became the first state to require recycling efforts at retail stores vis-à-vis legislation. This law prevented retailers from supplying plastic bags unless they simultaneously provided a storefront area designated for bags to be collected and recycled. In 2009, the District of Columbia mandated a five cent surcharge on all businesses that sell food or alcohol for each carryout paper or plastic bag. According to data collected by the Sierra Club, the five cent fee has resulted in a nearly 80 percent decline in use of single-use plastic bags. In August 2014, California became the first state to provide a statewide ban on single-use plastic bags at large retail stores. Additionally, the California bill required a 10-cent minimum charge for recycled paper bags, reusable plastic bags, and compostable bags at certain locations. However, some states have taken less aggressive approaches, and have instead imposed fees or taxes associated with the sale of plastic bags. The legislative efforts taken by each state has varied, as state lawmakers have introduced nearly 100 bills in 2019 related to plastic bags. (Ref. 10) [Back to Newsletter's Page 1](#)

5. ESD NEWSLETTER READER COMMENTS

None received this week.

Expecting the reader's comments and views on the newsletter. [Back to Newsletter's Page 1](#)



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ABOUT NEWSLETTER

ENVIRONMENTAL ENGINEERING features the application of environmental technologies to engineering systems to attain optimal performance according to established standards. The Newsletter of the Environmental Systems Division (ESD) will attempt to highlight a variety of environmental technology applications aimed at enhancing engineering systems performances in accordance with the latest standards by presenting excerpts of and links to selected articles from a variety of websites.

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