



ENVIRONMENTAL SYSTEMS DIVISION NEWSLETTER

01 DECEMBER 2019

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

Cultured meat: Just around the corner?

The idea of growing meat outside an animal has been around for a long time. In 1931, Winston Churchill wrote that by the 1980s "we shall escape the absurdity of growing a whole chicken in order to eat the breast or wing, by growing these parts separately under a suitable medium." Although his timing was off by four decades, his predictions are beginning to materialize as the world looks for new ways to feed its burgeoning population whilst overcoming the environmental problems of conventional animal agriculture. In 2013, Dr Mark Post of Maastricht University cooked and ate the **first synthetic burger** grown from cultured animal cells in front of a room full of journalists in London. Since then, the field of



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cultured meat, or "clean meat", has grown rapidly as start-ups worldwide compete to be the first company to bring a cultured meat product to market, with companies such as Memphis Meats, JUST, and Aleph Farms demonstrating prototype products. But when will the first products be ready? And will a lab grown steak be finding its way to our tables any time soon? The latest IDTechEx report, **Plant-based and cultured meat 2020-2030: technologies, markets and forecasts in novel meat replacements** by Dr Michael Dent, combines in-depth analysis of the science and technology within the field with industry understanding to explore the future of cultured meat, comparing it with plant-based meat, which has experienced a similar surge in publicity in recent years. (Ref. 1) [Back to Newsletter's Page 1](#)

Waste management market 2019 SWOT analysis & key business strategies

According to a new report published by Allied Market Research, titled, "Waste Management Market by Waste Type and Service: Global Opportunity Analysis and Industry Forecast, 2018 – 2025," the global waste management market size accounted for \$330.6 billion in 2017, and is expected to reach \$530.0 billion by 2025, growing at a CAGR of 6.0% from 2018 to 2025. In 2018, **Europe dominated the global market**, in terms of revenue, accounting for about **39.0%** share of the global waste management market, followed by North America. Waste management is the process of collecting, transporting, disposing, or recycling, and monitoring of waste. Rise in environmental concerns along with inevitable increase in nonhazardous waste, owing to rapid economic growth across developing nations drive the demand for waste management services. The other key factors that boost the growth of the waste management market include growth in adoption of recycling techniques, development of innovative technologies, and advanced waste collection solutions to enhance collection processes. The global waste management market is projected to exhibit a notable growth by 2025. (Ref. 2) [Back to Newsletter's Page 1](#)

2. ENVIRONMENTAL REGULATIONS

Wrap-up of Federal and State chemical regulatory developments, November 2019

EPA providing more time for public comment on its draft risk evaluations before the TSCA Science Advisory Committee on Chemicals (SACC) meets for peer reviewing draft documents. According to them, the new schedule includes a comment period of at least 30 days before SACC meets. EPA plans to complete ten chemical risk evaluations by June 22, 2020. To date, EPA has released six draft chemical risk evaluations, and SACC has peer reviewed four of them and is scheduled to peer review two in December 2019. For the remaining four chemicals, EPA intends to release two of the draft risk evaluations for public comment by the end of 2019 and the other two in January 2020. SACC will peer review the four risk evaluations in 2020. EPA will meet the Lautenberg Act's deadline to release all ten risk evaluations by June 2020.



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Last month, EPA published a Federal Register notice announcing the availability of and soliciting public comment on the TSCA risk **evaluation of methylene chloride (MC)**. 84 Fed. Reg. 57866. EPA is submitting the same document to the TSCA SACC for peer review. The draft risk evaluation states that EPA's initial determinations of unreasonable risk for the specific conditions of use of MC are based on health risks to workers, occupational non-users (ONU), consumers, or bystanders from consumer use. According to the draft risk evaluation, risks to the general population either were not relevant for these conditions of use or were evaluated and not found to be unreasonable. (Ref. 3) [Back to Newsletter's Page 1](#)

3. ESD CHAIRMAN/DIVISION NEWS

Congressional fellowship 2020-2021: energy and manufacturing

Who: Applicants must be a U.S. citizen and member of ASME at time of application.

Why: ASME Federal Government Fellows have served in the Executive and Legislative branches of the U.S. Government for the past 46 years applying their engineering expertise to complex issues.

Fellowships are a life-changing experience, resulting in new professional qualifications and providing Fellows with the satisfaction of having served the public good at the highest levels.

How: This program affords ASME Members an opportunity to move to Washington, DC, to serve a one-year Fellowship in the Executive and/or Legislative Branches of Government, where they provide engineering and technical expertise to policymakers.

More details: <https://lyris.asmestaff.org/t/511188/4615455/82054/0/>

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Message from the ESD Chair

ESD has organized and is planning many new events and conferences. For the past 5 years, ESD has funded an Education Support Program for schools and colleges worldwide. I have sat through two presentations from past winners and was very impressed with each project and how ESD funding was used to support environmental education curriculum. Please look for the notice for the 2020 competition in this newsletter, on the Division Facebook and Linked-In pages. Please distribute it to schools and colleges in your area.

In October, ESD planned and executed a successful Regulatory Engineering Forum. The forum included distinguished speakers and discussions on the state of regulatory engineering. ESD is planning another forum next year and may join forces with another engineering society. ESD is also very active in many ASME conferences, including the Power Conference and ACES (Advanced Clean Energy Summit). ICEM (International Conference on Radioactive Waste Management and Environmental Remediation) is being planned by ESD and NED (Nuclear Engineering Division) for 2021 in Europe.

None of this would have been possible without the staff support from ASME and the tireless work of our volunteers. Volunteers help promote ESD's mission to educate, convene, and



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collaborate with society and the engineering profession to advance environmental safety and health and drive the vision to be ASME's resource for environmental knowledge. Committees have been set up for members to plan out and assist each of ESD's projects. We are looking for volunteers for the following:

- Executive Committee Member-at-Large
- Honors and Awards (Dixy Lee Ray Award) Committee
- Environmental Engineering Student and Early Career Competition Committee
- Events Committee (plan ESD's role in Power Conference, ACES, Waste Information Exchange)
- Newsletter Board
- ICEM Planning
- Regulatory Engineering Forum Committee

information or interest please contact Ryan Neil, ESD Chair Ryanneil84@hotmail.com.

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Dixy Lee Ray award announcement

Why: The Dixy Lee Ray Award, established in 1998 "for outstanding engineering achievement in environmental protection through improvements in technology, science, and policy," recognizes significant achievements and contributions in the broad field of environmental protection. Achievement in the following areas will be recognized: environmental engineering, including environmental technology and related topics; other environmental areas, including environmental health, environmental sciences, environmental management and policy, and related topics. The award was established in honor of Dixy Lee Ray's advocacy to the development of those technologies that serve humanity. She believed that the engineering profession was uniquely qualified to develop and implement environmentally acceptable technologies. The person winning this award will be presented with a \$1000 honorarium, a bronze medal, a certificate, and will also receive a travel grant (not to exceed \$750) to attend the presentation ceremony.

Submit Nominations: Send nominations to the Award Committee Chair, M.C. Edelson, at mcedelson@gmail.com

Deadline: Must be received by February 1, 2020.

More Information: Contact the Award Committee Chair.

List of Past Winners: Available at (<https://www.asme.org/about-asme/honors-awards/achievement-awards/dixy-lee-ray-award>). [Back to Newsletter Page 1](#)

ESD MEMBER SPOTLIGHT: Dr. A. ALAN MOGHISSI

Dr. Alan Moghissi, ASME Fellow and ESD member, is the President of the Institute for Regulatory Science (RSI), a non-profit organization dedicated to the principle that societal decisions must be based on best available scientific information (BAS) including Metrics for Evaluation of Scientific Claims (MESC). The activities of the Institute include both research and science education. Dr. Moghissi is also an Adjunct Professor in the School of Medicine at Georgetown University. His relationship with ASME started when he initiated a course on



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radioactive waste. The course studied nuclear workers at US commercial nuclear power plants. He has organized several conferences.

Alan was a founder of ESD's Dixy Lee Ray Award, one of the most prestigious environmental engineering awards. He is past-chair on ASME's Committee on risk analysis, which led to the formation of the ASME Environmental Engineering Division (EED), otherwise known as ESD; changing names in 2019.

When asked about his association with ASME Alan stated that the interaction with outstanding individuals, who are dedicated to the advancement of technology for improving society, including the environment, was his primary reason for becoming a member. He is most proud of his contribution during the development of a peer review program that was overseen by ASME. Alan also believes that his organizing many short courses and conferences leading to many publications including several books has helped move the art and science of environmental engineering forward. He believes that ASME should continue to be involved in public policy to ensure a solid scientific and engineering foundation.

Dr. Moghissi received his education in Zurich, Switzerland at the University of Zurich and Federal Institute of Technology (ETH) and the Technical University of Karlsruhe (now Karlsruhe Institute of Technology) in Germany, where he received his doctorate degree in physical chemistry. Following his education, he was employed by the U.S. Public Health Service, which later a part branched off to become the U.S. Environmental Protection Agency (EPA). During his career at the EPA, he served in a number of capacities including managing the Bioenvironmental/Radiological program at the National Environmental Research Center in Las Vegas, NV and the Health and Environmental Risk Analysis Program in Washington, DC. Alan was Principal Science Advisor for Radiation and Hazardous Materials and represented the Office of Research and Development (ORD) on a number of working groups that drafted environmental regulations. Following his retirement from the EPA in 1985, Alan formed the Institute for Regulatory Science (RSI).

In 1989, he accepted a position at the University of Maryland at Baltimore (UMB) as Assistant Vice President for Environmental Health and Safety and in 1993 was appointed as



Associate Vice President for Environmental Health and Safety at Temple University in Philadelphia. During his tenure at these institutions, the functions of RSI were transferred to UMB and Temple. In 1995, RSI was reconstituted as an independent institute with Dr. Moghissi as its President. During the last three decades of his career, he has emphasized the need for reliance upon BAS/MESC as the foundation for societal decision-making, and has strongly promoted and advocated the peer review process as the cornerstone of BAS/MESC. Alan is the author of over 400 publications,



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including 25 books and 300 peer reviews and scientific assessments performed under his direction. Dr. Moghissi was the Editor-in-Chief of Environment International and Waste Management. He was also the Editor-in-Chief of Technology: Journal of the Franklin Institute. He is an honorary member of the National Council on Radiation Protection and Measurements; a member of the International Academy of Indoor Air Sciences; a former Councilor of the University of Puebla (UPAEP) Mexico; and a former Academic Councilor of the Russian Academy of Engineering. Alan was appointed by the U. S. Secretary of State as a Commissioner of UNESCO and served as a member of US Commission on International Hydrology Programme. He was also a Senior Fellow and member of the Board of Regents at the Potomac Institute for Policy Studies in Arlington, Virginia, and Associate Director of International Center for Regulatory Science at George Mason University. [Back to Newsletter's Page 1](#)

4. EDITORIAL BOARD SELECTIONS

Momentum for green hydrogen picking up in Europe

Hydrogen gas is the world's most abundant element and powered rockets and airships in the last century. It flames at 2,000 degrees Celsius (3,632 Fahrenheit) while giving off no more than water vapor as exhaust. The biggest problems with hydrogen is it is expensive to make and most often derived by splitting up molecules of natural gas, producing carbon dioxide. But that's changing. Some of **Europe's** leading energy and industrial companies are racing to develop **emissions-free** ways of producing hydrogen. They are focused on using **electrolysis**, where an electric current passes through water, splitting off hydrogen atoms from oxygen. When it's driven by renewable energy, it makes what the industry calls **green hydrogen**. (Ref. 4) [Back to Newsletter's Page 1](#)

Global pest control market forecast to 2024: (value, volume, CAGR, and revenue)

Pest control is used for killing, or repelling attacks of pests such as insects, rodents, and bed bugs. These pests not only damage the crops but also affect the human life through various diseases. Different types of professional pest control treatments to control or kill pest population comprises chemical, biological, and mechanical. Inspection is the fundamental step for any type of pest control service. The global pest control market was valued at \$2758 million in 2018, and is expected to reach \$4146.83 million by 2024, registering a **CAGR of 7.03% from 2019 to 2024**. The growth of the market is driven by its increase in demand from agriculture-based countries such as North America, Europe, Asia Pacific, South America and Middle East and Africa. However, increase in concerns regarding the levels of toxicity in pesticides and the resultant health issues that arise due to the over use of toxic pesticides hamper the pest control market growth to a certain extent. Consumers, especially in the agricultural sector and food industry, are focused toward opting for pesticides with low toxic levels, owing to their associated adverse effects on health. Manufacturers are committed to product improvement with international companies leading R&D efforts. Including some



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Chinese manufacturers, who are catching up with utilizing leading technology. Globally pest control manufacturers mainly distribute in North America and Europe, with major consumption regions within North America, Europe and Asia Pacific. Revenue share of North America and Europe are separately about 50.41% and 21.53% in 2017. Asia Pacific, whose revenue was \$410.09 Million in 2017, account for a share of 15.78%. (Ref. 5) [Back to Newsletter's Page 1](#)

Chemicals mixed leads to exposures and employee death

Most EHS managers can be seen 'wondering around' workplaces inspecting, implementing EHS into SOPs (Standard Operating Procedures), and never ceasing training for ensuring good housekeeping, incident response, and working equipment to prevent workplace mishaps. Some of us EHS managers in ESD who conduct training continuously look for examples to review with our employees during class. An incident last month surely was put into some members' training files already.

At least 15 employees and customers were treated at a local hospital after accidentally becoming exposed to a chemical mixture at a Burlington, Massachusetts Buffalo Wild Wings restaurant. The November exposure incident turned tragic when the restaurant manager died after becoming sick from chemical inhalation. An employee poured a sodium hypochlorite cleaner ("Super 8") onto the kitchen floor and immediately was overtaken by the fumes. Unknowing to the employee, an acid-based cleaner ("Scale Kleen") was spilled earlier and apparently the two chemicals mixed turning to a green bubbly solution and causing toxic fumes. While the employee stepped outside for fresh air, the restaurant manager then became sick when attempting to squeegee the solution out of the building. Rick Sachleben, a retired organic chemist and member of ACS (American Chemical Society), stated "Bleach by itself shouldn't be deadly. However when it's mixed with incompatible chemicals, it can generate toxic gases and that's probably what happened here" (Ref. 6). [Back to Newsletter's Page 1](#)

GM foods: The battle for Africa

A combination of climate change, population growth and regional conflict has created the worst food crisis across Africa since 1945 according to aid agency World Relief. Food Security Information Network's Global Report on Food Crises highlights in 2018 the African countries suffering the worst food shortages due to declining harvests driven by drought were, in order of severity, Democratic Republic of Congo, Ethiopia, South Sudan and northern Nigeria. Although 60% of the world's untilled, arable land lies on the continent, Africa accounts for just 4% of global agricultural output. Scientists blame low productivity on erratic weather patterns, drought, and poor seed quality and outdated farming methods. Yet producers of genetically modified (GM) seeds – produced from organisms that have had changes introduced into their DNA using the methods of genetic engineering – claim to have the answer. South Africa, Sudan and Burkina Faso are currently the only countries on the continent growing commercial quantities of crops from seeds genetically altered in a lab. Africa's GM market was estimated to be valued at around \$615.4m in 2018, and is forecast to grow around 5% to reach an estimated \$871m by 2025. But many African countries, including Kenya, Burkina Faso, Cameroon, Ethiopia, Ghana, Tanzania, Malawi, Uganda,



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Mozambique and Nigeria, are trialing various strains of GM seeds as the first step in a long approval process. (Ref. 7) [Back to Newsletter's Page 1](#)

Asia countries 86% of waste plastic costs; global impact \$19 billion/year

Land-origin plastic costs the global economy up to \$19 billion every year, according to new research. Asian countries account for 82% of global plastic waste coming from the land, with the economic impact of marine plastic pollution from these countries constituting 86% of the global costs estimated. In order to evaluate the economic impacts of land sourced marine plastic pollution, Deloitte has consolidated worldwide data on marine litter – its characterization, coastal population density, economic status, and direct and indirect impact – to develop a comprehensive database and a scalable assessment model to calculate the economic impact associated with marine plastic pollution to coastal communities. On top of the steep ecological price of current levels of pollution, Deloitte subsequently found plastic pollution could be resulting in an estimated economic loss of \$19 billion for 87 coastal countries. The biggest culprits of pollution were unsurprisingly found among the developing economies of Asia. Contributing 86% of the global cost associated with plastic pollution, Asia currently leaks more of the substance into waterways and oceans than any other continent. Europe meanwhile contributes a not-insignificant 24%. At the same time, the Middle East accounts for the lowest portion of clean-up cost associated with land-origin pollution, but has the highest level of economic value lost thanks to it. (Ref. 8) [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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NEWSLETTER ARTICLE REFERENCES

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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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