



ENVIRONMENTAL SYSTEMS

DIVISION NEWSLETTER

SEPTEMBER- 2019

ESD 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. ESD Members are encouraged to forward materials on Environmental Engineering topics for review by the Newsletter Editorial Staff. ESD Newsletter Readers are urged to forward comments on materials that appear in its content.

The ESD Newsletter will feature presentations in **Five** Sections:

- 1. ENVIRONMENTAL TECHNOLOGIES**
- 2. ENVIRONMENTAL REGULATIONS**
- 3. EED CHAIRMAN/DIVISION NEWS**
- 4. EDITORIAL BOARD SELECTIONS**
- 5. READER COMMENTS**

It is envisioned that the ESD Newsletter will be a monthly enterprise involving ALL members of the ESD in its production. Your participation in providing and reviewing ESD Newsletter materials will be greatly appreciated.

1. ENVIRONMENTAL TECHNOLOGIES

CalCom Energy's \$100M Fund Targets Farms for Solar-Battery Systems

In California, not just vulnerable families and critical services could use battery-backed solar systems to ride through wildfire-prevention power outages. Farms also have critical energy needs, like pumping water to crops on set schedules, or chilling them after harvest, that could face significant disruption under the state's new wildfire prevention regime. CalCom Energy, a long-time solar and energy services provider for California's agricultural sector, thinks it has a solution. This week, the Fresno-based developer launched a \$100 million Agriculture Energy Infrastructure Fund, aimed at combining low-cost solar power-purchase agreements with the backup power of energy storage.



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The fund, developed in partnership with Symbiont Energy and Live Oak Bank, marks CalCom's first foray into owning the systems it develops. Since its 2012 founding as CalCom Solar, the Fresno, Calif.-based company has developed more than 200 megawatts of clean energy projects, largely solar projects for farms and water districts. In fact, it is one of the largest commercial solar developers in the territory of Pacific Gas & Electric, the Northern California utility now in bankruptcy reorganization under the weight of tens of billions of dollars in liabilities from deadly wildfires started by its power lines in 2017 and 2018. (Ref. 1)

Bloom Energy: A 'Clean' Energy Darling Wilting To Its Demise

Bloom is a technology company that develops and manufactures stationary fuel cell systems. Bloom's systems, called "Bloom Boxes", are essentially generators that businesses can use to create on-site energy using solid oxide fuel cells, a technology that has been around for almost a hundred years. The boxes take an input, usually natural gas, and convert it into usable electricity. The scientific community, in general, has understood fuel cells, since the early 1800's and have been a largely unprofitable industry to date. Much of Bloom's popularity (and funding) was based on the idea that it could "break through" as the first profitable and sustainable fuel cell company. The company was founded in 2001 by KR Sridhar, a well-credentialed scientist who developed fuel cell technology at NASA before launching Bloom, quickly gaining the support of brand-name venture capitalists, such as Kleiner Perkins. By early 2008, a Department of Energy report [1] ranking solid oxide fuel cell projects by effectiveness placed Bloom's dead last by a wide margin. However, nearly a decade later, the company has been unable to fulfill its ambitions of being profitable and the realities of our research have led us to one conclusion: We expect Bloom Energy will become yet another tombstone in the Silicon Valley cemetery of dead unicorns. (Ref. 2)

2. ENVIRONMENTAL REGULATIONS

EPA Says there is No Need for New Hazardous Spill Regulations

In a recent "final action", the EPA announced that it will not "at this time" promulgate new regulations to prevent spills of hazardous substances (HSs) under Clean Water Act (CWA) Section 311. According to the Agency, the action fulfills the terms of a February 2016 consent decree the EPA reached with environmental groups, which was approved by the U.S. District Court for the Southern District of New York. In the decree, the Agency committed to issuing a notice of proposed rulemaking within 18 months and following that 14 months later with the "issuance of Hazardous Substance Regulations." While no such regulations are being issued, the Agency says it reserves the right to take such action in the future. Given that environmental groups have argued that Section 311 requires that the EPA issue regulations, it would not be surprising to these



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stakeholders returning to court to try to force the Agency into doing so. Here we review the reasoning the Agency gives for its final action. (Ref. 2a).

Environmental monitoring market to be worth \$ 26.7bn?

The environmental monitoring market is expected to be worth €24.4bn by 2025 as global aims for environmental consciousness continue. The global environmental monitoring market size is expected to reach USD 26.7bn (~€24.4bn) by 2025 at a CAGR of 9.5% over the forecast period, according to a new study conducted by Grand View Research, Inc. Growing rate of pollution levels, supportive regulatory and political scenario, and increasing awareness regarding pollution monitoring is anticipated to drive the market through 2025. Furthermore, adoption and implementation of environment-friendly practices in industrial operations is expected to play a pivotal role in the deployment of environmental monitoring systems worldwide. Based on component, particulate matter-monitoring systems are expected to witness the fastest growth owing to increasing health problems caused by exposure to particulate matter (PM) and strict regulatory steps to mitigate particulate pollution initiated by governments worldwide. By product, the monitor segment accounted for the largest share in 2018 owing to emerging sensing techniques, miniaturization of sensors, affordability, and easy integration with Internet of Everything (IoE). (Ref. 3)

Prepare now or pay later: Financial regulators must account for climate change risk to corporate bottom lines

Climate change poses a significant threat to global corporations, and financial regulators must transform how they account for the economic risks of a warming planet, Citigroup said in a new report Wednesday. "Greenhouse gas emissions, global warming and climate change are not only existential issues for those concerned with the future of humanity, they are also immediate concerns for financial regulators," the report said. The report, titled "Managing the Financial Risks of Climate Change," divides the threat of climate change into two categories: financial risks associated with effective action toward transitioning to a lower-carbon economy, and risks associated with a failure to effectively mitigate climate change. Financial regulators have primarily focused on how climate change affects big investor's liabilities and how they can improve conditions for low-carbon investments. The European Central Bank recently contended that central banks should go even further, and account for climate change risks not just as part of ensuring financial stability but also when setting monetary policy. Governments will also need to take steps toward a low-carbon economy, the report said, including implementing a carbon tax, cap-and-trade plans with emissions trading systems, and regulation to limit carbon pollution. (Ref. 4)

3. ESD CHAIRMAN/DIVISION NEWS



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2020–2021 ASME Congressional Fellowship: OPPORTUNITIES IN ENERGY and MANUFACTURING

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. This program affords selected 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 can provide engineering and technical expertise to policymakers. ASME Federal Government 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. Applicants must be a U.S. citizen and a member of ASME at the time of application.

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

50th Anniversary of ASME's Material & Energy Recovery Division

You may not be familiar with the history and activities of the MER Division. Our participation in ASME started in 1963 when a group of mechanical engineers in ASME forms a committee to help improve the design, operations and air emissions from municipal incinerators. In the early 60's almost every city in the greater New York City area had at least one large municipal incinerator to dispose of municipal solid waste. At that time, many of these incinerators were poorly designed and operated and were sources of air pollution. However, at the same time in Japan and Europe better designs were evolving and were generating power from MSW.

The mechanical engineers under the guidance of ASME formed a committee called the Incinerator Committee of ASME Process Industry Division. There was so much interest in solving our waste management problems the Committee after being established only one year was able to have a four-day conference in May 1964 to explore the use of combustion for waste management. The Incinerator Committee continued with bi-annual conferences through 1968. The work of the Incinerator Committee was recognized by ASME and the Committee was promoted to full Division status in 1969, which makes 2019 the 50th anniversary as a division. The division continued with their biannual conferences and due to the changing technology and advances in other areas of solid waste management, the division name was changed to Solid Waste Processing Division (SWPD) in 1975. In the mid 70's activities grew so fast that the division had subcommittees in New York, the Midwest, and California. The division also had subcommittees that were involved in sewage sludge and hazardous waste combustion.

In 1980 the SWPD Co-sponsored and funded an ASME Research Project "Study on the State of the Art of Dioxins from Combustion Sources". This report was used as a base for USEPA to develop



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dioxin emission standards for WTE plants. Biannual conferences continued and an international element was added to the conferences. In 1993, the first Annual North American Waste-to-Energy Conference, NAWTEC was held joining American Society of Mechanical Engineers (ASME), Integrated Waste Services Association (IWSA), and Solid Waste Association of North America (SWANA.) as co-sponsors. In 2001 SWPD Co-sponsored and funded the ASME research project "Reference Method Accuracy and Precision" (ReMAP) for stack test methods used in testing WTE plants. In 2010, in recognition to the growing recycling aspect the name of SWPD was changed to Material & Energy Recovery Division. There are many other activities, publications, and research that the division participated in which we will present in our next newsletter.

2019-2020 Floyd Hasselriis Support

In an effort to stimulate the interest of students in solid waste management and related fields, and to support colleges and universities that offer curriculum or courses in solid waste management and related fields, the ASME Materials & Energy Recovery Division (MER Division) offers the Floyd Hasselriis educational support program with awards totaling \$18,000. The educational support award amounts will be divided and shared between the winning student and his or her school. The application submission deadline has been extended to October 15, 2019 and the application can be found on the ASME website:

https://community.asme.org/materials_energy_recovery_division/w/wiki/3621.educational-support.aspx. For more information or to participate more actively in the MER Division, contact Len Grillo.

Congressional Briefing on the Benefits of Waste-to-Energy

The MER Division, together with ASME's Washington Office on Government Affairs, will hold an hour and one-half briefing for congressional staffers in late November 2019. The exact date has not been established at this time. The object of the briefing will be to demonstrate to the staffers the benefits that Waste-to-Energy projects bring to the overall waste management strategy. Currently there are at least two bills in Congress that will extend clean energy credits to waste-to-energy projects. Reps. Elise Stefanik, R-N.Y. and Scott Peters, D-Calif. have introduced the Renewable Electricity Tax Credit Equalization Act (H.R. 4186), which would extend and modify tax credits for qualifying renewable energy technologies — including biomass, WTE, hydropower, marine energy and biogas. Many WTE projects have been impacted by the declining price of electric power that they sell to utilities. These tax credits would help to stabilize the revenue from



the electric power provided to the power system. If you are interested in participating or attending this briefing, please reach out to Tony Licata at tonylicataleec@aol.com.

4. EDITORIAL BOARD SELECTIONS

15 % Increase in Plastic Bottles Washing Up on Inaccessible Island

Inaccessible Island is an extinct volcano and world heritage site rising out of the South Atlantic Ocean. Most of the island periphery is sheer cliff faces, yet a small number of boulder beaches do litter the island providing a small inlet to its terrain. Yet, due to the difficulty in landing here, Inaccessible Island has been largely uninhabited since explorers and sailors abandoned it in the 19th Century. However, researchers have recently discovered that this remote islet reveals the magnitude of the problem humanity faces concerning ‘the plastic problem.’ Between 2009 and 2018, scientists investigated over 11,500 items of waste and debris on the island and discovered that polyethylene terephthalate (PET) drinking bottles – mostly used for store-bought bottled water – were the recurrent items of waste in their survey. Surprisingly, whilst a container that dated back to 1971 was found on Inaccessible Island nearly all of the items in the recent 2018 survey were discovered to be dated within the past two years. This news comes from a paper published in Proceedings of the National Academy of Sciences (PNAS) which breaks some new ground on the origins of plastic waste. (Ref. 5)

PC-based system monitors, controls inventory and dosing in water treatment

Wastewater treatment may not be glamorous, but it is certainly one of the core components in the foundation of modern society. Clean water is vital in both consumer and commercial areas, including numerous industrial applications, such as mining, petroleum refining and groundwater remediation, in addition to residential applications. Bourne, Massachusetts-based Environmental Operating Solutions Inc. (EOSi) is no stranger to the importance of this process. The company has provided sustainable solutions and technical services for biological contaminant removal in water and wastewater treatment systems almost entirely in the U.S. and Canada since 2003. In addition, EOSi offers access to a skilled team of technical experts, ready and able to help plant engineers and operators optimize their process and achieve all performance goals. EOSi’s MicroC line of premium carbon sources offers a non-hazardous and environmentally sustainable option to remove contaminants such as nitrogen, phosphorus, selenium and perchlorate, among others. They contain various carbohydrate, alcohol and glycerin-based supplemental carbon sources,



representing the widest selection of supplemental carbon sources on the market. These products are subjected to the most rigorous quality control processes in the market to assure that customers receive consistently high quality products every time. (Ref. 6)

Cardiovascular Disease Tied to Occupational Pesticide Exposure

New data gleaned from the Kuakini Honolulu Heart Program — a longitudinal study of men of Japanese descent living on Oahu — demonstrate that occupational exposure to high levels of pesticides can increase risks for cardiovascular disease (CVD) in the forms of coronary heart disease (CHD) or stroke (CVA, or cerebrovascular accident). Further, researchers determined both that workers who experience high-level exposures may not experience such effects for years afterward, and that the maximum subsequent effects were seen within a decade of exposure. The study's conclusion highlights the importance of pesticide applicator use of protective gear when handling toxic pesticides. These risks and harms could be eliminated through a transition to non-chemical means for pest control in agriculture, land management, and home and personal practices. (Ref. 7)

GMO Testing Market with Top Countries Data: Market Growth, Competitive Analysis includes Key Players Profile

The GMO Testing research report intends to supply 360-degree perspective of the market concerning innovative technology, key advancements, Drivers and Restraints and prospective trends with impact analysis. It conserves the entry-level analysis by identifying the market growth, measurements, best players and segments. In depth interpretation of the products present stage of the market growth, land and launching dates. Global GMO testing market is registering a substantial CAGR of 8.3% during the forecast period of 2019-2026. Increase in consumer concerns toward GMOs food products may propel the GMO testing market to grow. Genetically Modified Organisms (GMO's) are organisms that undergo modification in their DNA structure by using biotechnology instruments. The food products can be produced by using genetically modified organisms in a manner to get good quality of food product. These products are tested by various testing methods such as analytical method, qualitative method and quantitative method. The test provides the results and shows presence of GMOs. Increase in need for nutritious food products among consumer helps the market to grow in food industry. (Ref. 8)

Caribbean Islands Are the Biggest Plastic Polluters Per Capita in the World

In 2016, global plastic waste amounted to some 242 million metric tons. Of this, 137 million tonnes (or more than 57%) originated in East Asia, the Pacific, Europe, Central Asia and North



America, much of which made its way into the ocean. In 2015, the Journal of Science surveyed 192 coastal countries and confirmed that Asian nations, most notably China, Indonesia, the Philippines, Thailand and Vietnam, were 13 of the 20 biggest contributors of marine plastic waste. Nevertheless, as is often the case, numbers alone do not tell the entire story. Case in point: the little island of St. Lucia, which produces the 6th largest amount of plastic waste per capita in the Caribbean, generates more than four times the amount of plastic waste per person as China— the world’s largest plastic polluter in absolute terms— and is responsible for 1.2 times more improperly disposed plastic waste per capita than China. (Hannah Ritchie and Max Roser in <https://ourworldindata.org/plastic-pollution>) Of the top thirty global polluters per capita, ten are from the Caribbean region. These are Trinidad & Tobago, Antigua & Barbuda, St. Kitts & Nevis, Guyana, Barbados, St. Lucia, Bahamas, Grenada, Anguilla and Aruba; and every year; these ten island nations generate more plastic debris than the weight of 20,000 space shuttles. (Ref. 9)

5. ESD NEWSLETTER READER COMMENTS

Expecting the reader comments and views on the newsletter.

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