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Dear Reader,

I'm always inspired by the creativity and ingenuity from sustainability professionals in how they navigate the unexpected environmental and energy management challenges they face every day — and this year, more so than ever. Beginning in the early part of 2020, it turned out we were all facing unexpected challenges. By March, when covid-19 was declared a pandemic, our world felt like it was turned upside down. We, like you, struggled to understand how our employees, our business partners, and ourselves would move forward in terms of both our professional and our personal lives.

At Environment + Energy Leader, we needed to decide how we were going to celebrate our award winners when we could no longer hold an in-person event. We had to shift our plans, conceptualize something totally new, and implement it quickly. Ultimately, we decided to host an online Awards Summit on July 21, 2020. The archived video presentations will be available afterward on our website here.

With these shifts in thinking, I began to consider how the new world situation relates to the people actively working in sustainability and energy management. People like you — people who tune in for educational webcasts, attend conferences, or download reports like this to look for inspiration — are the people who are able to shift their thinking at a moment’s notice. You know how to pivot, accept new realities, change direction, and make new plans without panicking. In fact, you do it all the time.

And that’s what makes the world of energy, sustainability, and environmental management such an exciting world to be living in. You’re making a difference in terms of things like reducing waste, improving supply chain sustainability, cutting energy costs, reducing emissions, and so much more. And you’re doing it right now, even though the world is facing so many other challenges.

Before you read on, I’d like to point out that judging for this year’s Environment + Energy Leader Awards began during the start of the pandemic. We had dozens of experts lined up as judges, but learned that some had been furloughed while others had family members who fell ill. Because of these and other difficulties related to the virus, many were understandably unable to participate. But, in an enormous show of generosity, the rest of the judges volunteered extra time to ensure that every entry received appropriate evaluation. So when I say “thank you” to this year’s judges, I mean it whole-heartedly. This program couldn’t happen without them. Please check out the judging panel on page 100, and remember that they went above and beyond this year.

Now sit back, discover the judges and winners in the report that follows, and enjoy. And know that, whether you’re featured in these pages or not, you’re the reason the world is seeing such sustainability and energy management success. No matter what industry challenges you face, you can rise to the occasion — and do so brilliantly. I’m honored to be in such outstanding company.

Best Wishes,

Jen

Jennifer Hermes
Content Director
Environment + Energy Leader
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<td><strong>Peter Bussey</strong></td>
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<td><strong>Kirby Dipert</strong></td>
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<td><strong>Jody East</strong></td>
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<td><strong>Billy Grayson</strong></td>
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<td><strong>James Goudreau</strong></td>
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<td><strong>Kyle Gumto</strong></td>
<td>Energy Procurement and Environmental Sustainability Manager, Cardinal Health</td>
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<td><strong>Charles McEwan</strong></td>
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<td><strong>Dave Meyer</strong></td>
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<td><strong>Mary Jo Press</strong></td>
<td>Global Safety Center of Excellence Management, Tesla</td>
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<td><strong>Travis Solberg</strong></td>
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Judges’ Choice:
Vigilent
Dynamic Cooling

Accuvio
Accuvio Author

Armstrong Flooring
Migrations and Striations BBT with Diamond 10 Technology Coating

Cority
Cority Emission Inventory Site Diagram

DesignLights Consortium
DLC Networked Lighting Controls Online Qualified Product List

Energy Focus
EnFocus

Gensuite
Product Steward

Greenstone
Greenstone Enterprise

Kinestral Technologies
Halio Smart-Tinting Glass

Magnation Water
Turbulator

Pepco Holdings
Pepco Energy Savings for Business Program Monitoring-Based Commissioning

Sacramento Municipal Utility District
SMUD Energy StorageShares

Shannon Global Energy Solutions
Shannon Thermal Reusable Blanket Insulation

Sphera
Corporate Sustainability Software

Sphera
BOMcheck

Sphera
Life Cycle Assessment

TerraCycle
Loop

Turntide Technologies
Smart Motor System

Vertiv
Vertiv HPL Lithium-ion Battery Energy Storage System

Wolters Kluwer
Enablon
Ameresco
United States Marine Corps Recruit Depot Comprehensive Energy Resiliency Project

CPower Energy Management
Advanced Microgrid Design for Indoor Agriculture Pioneer

Digital Realty
Digital Realty Global Water Strategy

Eastman
Carbon Renewal Technology

EcoEnergy Insights
Digital Transformation of the Facility Management of a Manufacturing Plant

Enel X
Enel X Solar plus Storage plus EV Charging Project at the University of Massachusetts Boston

EnergyLink
Oxford Vista Energy Redevelopment Project

Exelon
Energy-Saving Trees Program

Fetzer Vineyards
Leveraging the Internet of Things and Big Data to Stay Steps Ahead of Water Waste

Intelex
Implementation of Intelex ACTS for PDC Energy

Johnson Controls
Infosys

Lockheed Martin
RMS Troy Energy Star

Lockheed Martin
Mooresstown Steam Decentralization

MilliporeSigma
Dozn 2.0: A Quantitative Green Chemistry Evaluator

NextEra Energy Resources
Iron Mountain Solar

PowerSecure
Butler Farms Microgrid

Resolute Forest Products
Bio-Products Derived from Wood to Advance North American Bio-Economy

Saudi Aramco
Global-Scale Groundwater Conservation

Schneider Electric
College of Southern Nevada Saves Energy with Schneider Electric

Schneider Electric
Schneider Electric and the City of Sierra Vista

Schneider Electric
Schneider Electric and Stockton, California

Terrapure Environmental
Lead-Acid Battery Recycling

Trane Commercial
Ford Motor Company Data Center Chiller Plant Project

Underwriters Laboratories
Characterizing and Assessing Particle and Chemical Emissions from 3D Printers
The company Vigilent uses internet of things (IoT) and artificial intelligence (AI) to deliver dynamic cooling management in mission-critical environments. Data centers consume around 420 terawatt-hours per year and cooling, which accounts for 40% of overall data center energy usage, can be extremely difficult to manage due to changes in IT load and the complexity of airflow, Vigilent said.

Data center and telecom managers who use traditional rules of thumb and simple control technologies to cool their facilities risk over-paying for cooling equipment, wasted capital, excessive energy costs, and even heat-related IT outages, according to Vigilent. Instead, the Vigilent Dynamic Cooling Management System has AI and machine learning software, sensors, and analytics that can solve the complex cooling optimization problem for operators of data centers and telecom facilities.

Vigilent explained that its AI system uses an industrial IoT architecture to address challenges simultaneously. Wireless temperature sensors are deployed at the inlet to IT equipment, and wireless control modules get installed on each air conditioner. The software learns the relationships between each air conditioner and sensor, developing a predictive model of the environment, according to the company. The system then uses this knowledge to dynamically optimize cooling, meeting specific thermal requirements at every required location in real time. As the environment changes over hours, days and years, the system automatically updates the predictive model and re-optimizes cooling, Vigilent said, delivering cool air to IT equipment in the most efficient way.

Customers deploying Vigilent reduce energy consumption and see a cooling energy reduction of 30 to 50%, which saves money and cuts CO2 emissions, according to the company. They also see a hot spot reduction of 99%, reducing the risk of catastrophic outage, and a cooling capacity increase of 10 to 15%, enabling the addition of
The solution dramatically reduces energy consumption, CO2 emissions, hot spots, and catastrophic outages while increasing cooling capacity and improving IT profitability.

more revenue-producing IT applications. The company says that the Vigilent AI system has more than 800 deployments across 27 countries, optimizing cooling in 1.9 million square meters of data centers and telecom facilities, saving over $50 million annually in energy costs. Their customers include IBM, Hutchison, Itau, NTT, Spark, the State of California, Telus, and Verizon.

When Spark deployed Vigilent in an Auckland data center, they automatically reduced energy consumption by 517,000 kWh per year, Vigilent said. Spark’s head of property Ron Brown said, “Setup took two weeks, and immediately we could see that nearly half of the coolers were on standby. The savings we make on energy means we are able to invest more in our products and services for customers. Being able to plan, and reduce cold and hot spots means a long-term benefit as hardware life is greatly extended.”
Accuvio Author is a sustainability report and ESG questionnaire response authoring and collaboration productivity tool. It incorporates instant messaging, change control, version control, section-by-section review, and approval signoffs, as well as the instant reusing of content in multiple reporting frameworks and questionnaires.

The tool was created in response to Fortune 1,000 companies having to report into multiple environmental social governance and sustainability frameworks consistently and accurately from 2019 to 2020. Since 2018, this challenge has intensified as more than 2,500 institutional investors signed the UN Principles for Responsible Investment, committing to ensuring that the companies they invest in disclose climate change effects and other ESG metrics.

This product combines the exact tabular formats required by GRI, CDP, DJSI, GRESB, SASB, and others with textual information from around the company’s organization in a workflow-driven process, Accuvio said. Numerous stakeholders can simultaneously edit and review corporate sustainability reports and ESG questionnaires. Clients can use the tool to take a “master data approach,” where they collect all information once annually and reuse it for all reporting frameworks.

The new Accuvio Author module works with the Accuvio GHG module and the ESG module, which calculate GHG emissions for large enterprises. Combining the Accuvio Author module with the numerical outputs from the GHG module and the CSR module, the reporting process is streamlined and completely auditable, according to the company. Accuvio Author offers clients the ability to create reports that have the GRI index instantly prepared for the report design team. Inline messenger allows for fast and efficient collaboration on report sections in parallel with a detailed audit trail, Accuvio added.
What we are faced with right now is reducing greenhouse gases. This type of technology can help us find the path.”

Since the Accuvio Author enterprise product became available in August 2019, it has been purchased by seven Fortune 100 companies, four FTSE 100 companies, and many others. Product users say that it has made a difference in their approach to the curation of annual sustainability reports, and increased the number of ESG questionnaires they can respond to with the same number of staff, increasing share value and improving stock risk ratings, Accuvio said.
Armstrong Flooring’s BioBased Tile (BBT) flooring collections, called Migrations and Striations BBT, are made from limestone. When the flooring company completed a life-cycle assessment (LCA) of their BioBased Tile, they discovered that the largest global warming potential occurred during the products’ use phase. Although the company can’t control this phase, the product design directly affects the maintenance requirement.

The company’s vinyl composition tile is made from 85% limestone and 15% vinyl binder, while their BBT is 85% limestone but with a bio-based polymer binder. Both products have lower environmental effects than the rest of Armstrong Flooring’s portfolio due to the limestone content, the company said. However, the LCA revealed opportunities to make improvements during their use phase.

Armstrong Flooring developed a proprietary coating, Diamond 10 Technology, that uses cultured diamonds to provide the scratch, stain, and scuff resistance. Diamonds outperform all other common competitive flooring finishes on the Mohs scale of mineral hardness, according to the company, adding that their proprietary technology scores a perfect 10 on the scale.

The coating allows facility managers to reduce or eliminate initial polishing and restorative stripping and recoating. Modifying the product design to incorporate the protective coating reduced the required maintenance and the cost to maintain the flooring by approximately 40% compared to traditional vinyl composition tile maintenance procedures, according to the company.

Redesigning the product resulted in a 5% reduction in global warming potential during the first year, and a 37% reduction in global warming potential over the life of the building, Armstrong Flooring said. A 5% reduction equates to a reduction of approximately 0.23 kilograms of carbon dioxide equivalent (CO2e) per square meter. The
WHAT THE JUDGES SAID...

The company took the next step that we in the sustainability world hope other manufacturers consider. A true win for how the life-cycle process should work.”

company estimated that the US market for vinyl composition tile is around 400 million square feet annually. If all of that flooring installed Armstrong Flooring’s products with this new coating, it could reduce greenhouse gas (GHG) emissions in the first year by 8,500 tons.
Cority’s Site Diagram module is part of the company’s Emissions Inventory software, which is designed to provide environmental professionals with a visual representation of their air emission processes. This enables users to view complex asset-to-asset relationships, manage emissions from a single application, track permit compliance, and identify improvement opportunities to reduce emissions, Cority said.

Site Diagram centralizes, standardizes, and streamlines the management of emissions programs, and offers users visual information and real-time data side-by-side. It can save clients time and money during implementation, according to Cority. The software also helps users share institutional knowledge with others without spreadsheets or email chains.

The visual tool allows customers to configure and manage the emissions inventory end-to-end from a single point of reference, meaning they can look for opportunities to reduce emissions, supporting corporate sustainability goals related to the reduction of hazardous air pollutants and GHG, Cority said. Visualizing assets alongside permit conditions can help ensure compliance. Site Diagram enables faster implementations, according to the company. Managing complex asset relationships and calculations after implementation is simpler and more intuitive for users than traditional EHSQ software, the company added.

In 2019, Cority had several clients in the implementation phase. Once they go live, the company estimated that Site Diagram would help cut implementation costs by as much as 20% and reduce the time to implement by eight weeks. After implementation, Cority said it expects clients would spend far fewer hours compiling data for quarterly and annual emissions reporting, enabling air experts to be more proactive and identify new opportunities to reduce their emissions footprints. At the same time, the software could

[ continued on next page> ]
WHAT THE JUDGES SAID...

Using a graphical interface tied to the database makes setting this up intuitive. A great product.”

help air experts deliver additional value to their companies by reducing emission credit purchases, sale of existing credits, and a reduced risk of non-compliance due to an exceedance or deviation.
The DesignLights Consortium (DLC) is a nonprofit organization that aims to achieve energy optimization by enabling interconnected solutions with a focus on quality for people and the environment. The DLC Networked Lighting Controls (NLC) program is a suite of tools and resources to enable the widespread adoption of networked lighting controls in commercial buildings. It defines the system capabilities that achieve energy savings and evaluates lighting control systems based on the presence or absence of these capabilities.

Systems that meet the minimum requirements are listed on the NLC Qualified Product List (QPL), a searchable and filterable online tool that provides key information about each system. Utility energy efficiency programs can use the list to provide savings incentives, and lighting professionals can use it to select appropriate systems for their projects.

A 2017 study showed that networked lighting controls can boost the energy efficiency of stand-alone LED commercial lighting projects by an average of 47% compared to an LED-only project, the DLC said. Utility energy programs for LED lighting upgrades can realize an additional 22% average lifetime energy savings by including networked lighting controls along with LED lighting, a 2019 study found, according to the nonprofit. However, networked lighting controls market penetration remains low.

In 2019, the DLC launched an online Networked Lighting Controls program Qualified Product List, offering an improved search and product comparison process with filters designed to identify product features such as manufacturer, ease of installation, wired or wireless communication, energy monitoring, and advanced capabilities. Through a customized column menu, users can also search for options that meet specific project needs, such as color tuning and cybersecurity features. Previously the NLC QPL was only available as an Excel spreadsheet, the nonprofit said.
WHAT THE JUDGES SAID...

This searchable and filterable online tool makes it easy to understand the benefit of installing additional controls at the start of a project, not just a switch to LEDs.”

The Qualified Product List provides a centralized resource for information. Efficiency programs benefit from reduced time spent determining eligibility and energy savings potential, the DLC said. Manufacturers benefit from having their products evaluated by a central, objective third party. Designers and end users can compare several different NLC systems at the same time. Adding networked lighting controls to LEDs provides increased savings from dimming, and operating lighting only where and when it’s needed, the DLC pointed out. The organization says that its online NLC QPL tool accelerates the adoption of high performing lighting solutions by removing the barrier of complexity.
The EnFocus lighting system from Energy Focus is a dimmable lighting control product built using the company's patented control platform for use with their T8 lamp. This product enables existing buildings to implement dimmable and tunable LED lighting at lower cost compared to other control technology, particularly for the retrofit market, the company said.

The system replaces existing wall switches and fluorescent or tubular LEDs with a control package that includes switches and LED lamps that are dimmable and color tunable, without requiring additional wiring and electrical work. EnFocus lets users add controllability to any application by using its switch to communicate with the lamps over the AC wires, Energy Focus said. It retains more than 0.90 power factor as the lamps dim to 10% power so end users can achieve additional energy savings while maintaining essentially flicker-free light output, the company added. Energy Focus says that its lighting controls can provide around 30% of additional energy savings for the lighting system.

Energy Focus seeks to make products for the retrofit that are user-friendly, easy to install, and have a long life. Rather than produce fully integrated fixtures that require replacing existing fixtures — creating significant unnecessary material waste — the company’s lamp-centric products can be used to retrofit existing fixtures. The company used this approach for their EnFocus control system, designing it around the wall switch to use the AC wires to communicate with the T8 lamps, minimizing the amount of material that needs to be removed for an installation. This reduces the cost of goods and labor needed for installing the system, Energy Focus said.

Energy Focus said that energy service companies (ESCOs), which use lighting retrofits to offset HVAC updates, have avoided lighting controls due to the increased cost and effect on project payback. These companies have expressed interest
“WHAT THE JUDGES SAID...

The ease of installation of this unique system offers competitive advantages over other lighting retrofit systems.”

in implementing the Enfocus system, according to Energy Focus. “The EnFocus system is allowing us to provide a cost-effective solution to projects that would have been missed opportunities for adding controls and achieving additional energy savings, improving human comfort, and performance over just converting to LEDs,” the company said.
Gensuite Product Steward, part of the company’s Product Stewardship and Sustainability software suite, aims to streamline product compliance, product sustainability, and supply chain sustainability programs. Users can centralize and automate upstream supplier and manufacturer engagement and data collection to help inform smart, environmentally-sound product design and production activities.

By better understanding regulatory compliant materials and materials with the highest composition of recycled content, product teams can design and make products that are safer for the environment, the workers manufacturing them, and end users, Gensuite said. Organizations can collect and validate upstream supplier and manufacturer information on sustainability goals, policies, and practices that have direct community effects, and affect products made by downstream manufacturers and assemblers.

Gensuite Product Steward allows organizations to address product and supply chain compliance obligations as well as market-driven or customer-driven sustainability objectives. Through Gensuite’s web-based Supplier Portal, organizations can centralize upstream supplier and manufacturer engagement. The Supplier Portal provides industry-standard templates for due diligence questionnaires, and a custom questionnaire creation option.

Product Steward also connects with internal enterprise resource planning systems such as SAP and Oracle as well as product engineering systems like PLM. This enables integrated, automated data-sharing and better informed decision-making around product design and product life-cycle management.

Organizations across industry sectors use Product Steward to manage several million products, component materials, and associated regulatory,
WHAT THE JUDGES SAID...

“This solution allows companies to move beyond discerning whether key suppliers submitted to external carbon assessments. It’s a game-changer for product manufacturing decisions.”
Greenstone Enterprise is software that allows organizations to define, measure, manage, and report the non-financial aspects of their businesses. The modular software covers environment, frameworks, health and safety, supply chain, and investor ESG. Users can gain a complete picture of their sustainability performance with granular data and user-friendly analytics, the company said.

The software helps organizations reach their sustainability goals, reduce their carbon emissions, report against international frameworks, and understand their environmental effects. Greenstone supports the software a team of subject matter experts so users can make informed business decisions, monitor outcomes and revenue savings, and report against specific KPIs.

Greenstone takes a client “ecosystem” approach, meaning that their wider client network can share best practice technology. The company developed a Sustainability Framework Mapping functionality within Enterprise’s Frameworks module that allows organizations to consolidate reporting, minimize risk, and increase efficiency when reporting against multiple reporting frameworks. Sustainability Framework Mapping helps clients categorize and group ESG metrics and set up tags for different frameworks, making specific data sets easily exportable when required.

Currently the software is used across more than 110 countries and has data from over 25,000 sites. The product also has assurance from more than 60 external audits as well as alignment and mapping with 30-plus international frameworks. Since the product’s inception, more than 55 million tons of CO2e is under management.
WHAT THE JUDGES SAID...

Companies are having to look harder at CSR reports, ESG reports, and sustainability plans. This product fulfills a need that is becoming more of a requirement.”
Kinestral Technologies’ Halio smart-tinting glass eliminates the need for blinds and shades, offering the health benefits of natural light without the loss of energy efficiency, privacy, thermal or visual comfort. Halio windows and lighting systems work with building systems so that tint levels and artificial lighting automatically adjust to maximize daylight, the company explained.

In developing Halio, the company says that it made improvements in tinting speed, tinting and color uniformity as well as high-volume, high-yield manufacturing. To date, Kinestral has earned 64 patents related to Halio. The product was designed to tint and clear 10 times faster than its predecessors. Halio looks like natural glass in its clear state, and tints to neutral cool gray shades rather than the amber and dark blues of competing products.

Earlier electrochromic glass had historically low manufacturing yields due to imprecise sputtering technology, Kinestral said. The company added that it uses mature, proven standards with chemistry and process control quality checks. Its manufacturing process creates yields similar to the flat-panel industry, which produces less manufacturing waste and has a lower cost.

Halio’s cloud computing architecture is designed to easily integrate with smart city or smart building infrastructures. A completed Halio device is constructed on fully sealed high-quality display glass, allowing facade designers to pair it with a variety of third-party products such as bird-friendly glass, selective low-E coatings, and colored glass.

Cities worldwide increasingly have building efficiency requirements. Buildings that use Halio meet California’s Title 24 requirements and help achieve the emissions goals required by Local Law 97 in New York City. Halio reduces HVAC and electrical lighting needs, lowering energy consumption by as much as 20%, according to
WHAT THE JUDGES SAID...

An innovative product that has the potential for large-scale environmental benefits in the built environment. It has clear advantages over older electro-chromatic glass.”

Kinestral. As a result, the product supports several well-known environmental building certification programs such as LEED, BREEAM, and WELL. Projects that use Halio include the Gare Maritime at Tour & Taxis in Brussels and two commercial offices in the San Francisco Bay area.
Magnation Water’s Turbulator product is a patented inline, no-salt water softener that the company says doesn’t require any chemicals, electricity, or maintenance as soon as it’s installed at a main pump, the bottom of a well, or an incoming main line. The Turbulator can treat hard water problems, including preventing and reversing mineral scale, reducing pumping costs by as much as 42%, and saving billions of gallons of water across industries that include agriculture, landscape and turfgrass irrigation, industrial, and residential use, according to Magnation Water.

As the company explains, water molecules bond with minerals and gasses in naturally occurring conditions to form water molecule clusters — also known as hard water — with high surface tension, which causes excess friction during the movement of water. The Turbulator pulls apart the bonds that keep the gasses and minerals trapped in the oversized water clusters, and then polarizes the liberated molecules, the company said. This polarization prevents molecules from sticking together, mitigating scale formation and biofilm as well as preventing the cavitation that allows bacteria to flourish.

The Turbulator inline water treatment system relies on physics rather than electricity or chemicals to achieve results. It mimics nature by creating rainlike water, reducing chemical contamination, improving soil productivity, crop yields, and plants as well as reducing carbon dioxide (CO2) emissions, according to Magnation Water. With this product, surface runoff, evapotranspiration, and percolation are no longer problems — and each drop of water becomes more productive, the company said.

One of their agriculture customers commented, "In a typical year in Central Nebraska, we pump seven acre inches of irrigation water on our corn crop on a quarter-section pivot. With the field-proven conservative 25% savings in pumping requirements, once Turbulator is installed, the
WHAT THE JUDGES SAID...

A superior product that hits the mark relative to energy savings standards worthy of recognition.

The amount of water we save annually is huge." A residential community in Colorado reported saving 10 million gallons for their fields and irrigation, and a school district in California said that using the Turbulator improved moisture retention by 251% and used 50% less water.
Exelon subsidiary Pepco Holdings operates electric utilities serving areas around the Atlantic. Their Energy Savings for Business (ESFB) program has an incentive called Monitoring-Based Commissioning (MBCx) designed to optimize the performance of a facility’s equipment and systems by focusing on low- and no-cost energy efficiency measures by using data analytics. MBCx program participants receive incentives to help offset capital investments, Pepco explained.

A typical MBCx project goes through installation, monitoring, and implementation phases aimed at resolving operating issues by calibrating equipment, improving occupant comfort with proper temperature setpoints, and optimizing energy usage in an existing building. The program pays participants incentives on a dollar-per-kilowatt-hour (KWh) basis, which can include an additional four cents per square foot for ASHRAE Level 2 audits performed on the facility, according to Pepco.

Pepco says that its ESFB program provides Maryland business customers a pathway to energy savings through strategic partnerships with service providers. One of the program’s approved service providers, Datakwip, which has a software-as-a-service platform that combines a building’s unique data with real-time information. Using a virtual submetering module and the customer’s utility rate schedule, Datakwip illustrates real-time costs analysis for energy-related data, including savings and estimated ROI for automated recommendations, Pepco explained. It also integrates services provided by the MBCx program to capture incentives that offset the software’s cost, helping maximize the ROI.

MBCx program participants receive financial incentives to offset capital investments while identifying potential energy- and cost-saving measures. Utilizing system analytics, equipment and schedules can be fine-tuned to align with a
Property owners and operators can use this platform to judge what needs to be changed, or turned on and off. Helps identify savings.

In 2019, Pepco reported that 23 MBCx applications had either been completed or were being processed, with Datakwip directly involved in 20 of the active applications. A variety of facilities including restaurants, multi-family properties, commercial office buildings, and industrial buildings are running the analytics software. Pepco said that even though every ESFB MBCx project is unique and energy savings tend to vary, the typical project can save 400 MWh on average.
The Sacramento Municipal Utility District (SMUD) is a community-owned electric utility that serves more than 1.5 million customers across 900 square miles. In 2018, their board of directors set the goal of reaching net-zero GHG emissions by 2040. At that point, the utility projected that it would need more than 500 MW of battery energy storage to get there.

SMUD developed the Energy StorageShares program to reduce commercial customer demand charges, improve the use of existing utility infrastructure, and minimize negative effects on the grid. The program gives commercial customers that are considering behind-the-meter battery storage for peak demand charge management the opportunity to invest in a utility-scale battery. Customers then receive credits on their bills for what they would have saved with their own battery storage, the utility explained. SMUD deploys the utility-scale battery at a constrained grid location, which avoids costly new infrastructure installation or upgrades.

The utility-scale battery can charge with excess renewable generation during peak solar production or during off-peak usage hours, SMUD said, adding that the value created with a large-scale battery deployment is greater than the collective benefit would be from individual installations. Customers maximize their financial savings while SMUD minimizes the cost to upgrade or deploy new grid infrastructure.

Eligible commercial customers pay SMUD upfront for program participation and receive a monthly on-bill credit for a 10-year term, the utility said. SMUD bundles the investments from program participants with its own capital and procures a battery at a location on the grid that creates increased local benefits. The program provides guaranteed savings to customers without affecting their business operations, maintenance obligations, or requiring physical space for a battery system. SMUD’s utilization of the battery reduces the risk of stranded assets and defers infrastructure costs, benefitting all of their customers.
WHAT THE JUDGES SAID...

Innovative and groundbreaking. The program provides guaranteed savings to the customers without affecting their business operations or requiring physical space.”

SMUD made its Energy StorageShares program available to many eligible commercial customer segments. The program’s first phase began in Q1 2019, offering 4,000 shares for purchase. EV charging company Electrify America was the first customer to enroll, investing $1.3 million to purchase a large portion of the shares to help reduce their demand charges. Under the agreement, Electrify America receives monthly recurring on-bill credits for the demand reduction needs at the company’s 12 electric vehicle charging stations powered by SMUD in the Sacramento area. Expanding EV charging availability also supports SMUD’s goal of having more than 700,000 electric vehicles in their service territory by 2040. 

2020 Environment + Energy Leader Awards
Shannon Global Energy Solutions engineers and manufactures machinery insulation products. The Shannon Thermal Blanket Insulation is a specially designed, pre-engineered reusable insulation system that can capture radiant heat and save energy.

Energy managers install insulation on steam lines to help reduce energy consumption, but workers carrying out routine maintenance often remove and throw away this insulation because it can’t be reused. Most insulation goes on pipes, ignoring complex valves and fittings. The US Department of Energy’s Advanced Manufacturing Office advises that maintenance engineers “use removable insulation on components requiring periodic inspections and repair,” Shannon noted. This approach saves millions of BTU/h within less than a year while increasing safety and profitability, according to the company.

The EPA says 16% of methane emissions come from landfills, so reducing the amount of waste sent to landfills can help mitigate climate change. Hard-coated insulation gets removed from components during maintenance and then is thrown away. Fiberglass insulation is often tossed when removed or damaged. The Shannon Thermal Blanket, however, is easy to install, remove, and reinstall, the company said. Durable materials allow the insulation blankets to last 15 years or more.

Every blanket is manufactured by computer aided design (CAD) using a library of more than six million files to achieve an exact fit, according to the company. CAD files drive the computer numerical control (CNC) software, which minimizes production errors and increases geometric tolerances well beyond industry standards, Shannon said.

The company reported helping George Mason University save more than $1 million since 2009.
WHAT THE JUDGES SAID...

A disruptive solution for hot water and steam systems that improves equipment performance, reduces landfill waste, and improves environmental conditions for workers. Outstanding.

"By reducing heat loss and energy, we got a payback in under 15 months with each reusable blanket," said Patrick Buchanan, George Mason University’s energy manager. The university’s CHCP equipment and high temperature hot water components provide a heating capacity of approximately 115,000 MMBtu to more than 145 buildings. Buchanan said that the George Mason facilities’ footprint grew from roughly 3.5 million square feet in 2006 to 9 million square feet in 2019, but the energy costs only rose 20% during that time.
Sphera's Corporate Sustainability Software, formerly called SoFi, is a web-based solution that supports automated and manual sustainability data collection, aggregation, management, and reporting. The software can adjust to changing conditions, respond to shifts in internal organizational structures or sustainability priorities ranging from carbon accounting to sustainability reporting such as GRI, CDP, SDGs, SBTs, Scope 3.

The Corporate Sustainability solution helps companies reach their goals by providing a single centralized source for an organization's sustainability data and by supporting target setting and performance tracking, Sphera said. Clients can understand their sustainability baseline, track performance in real-time against established goals, identify opportunities for change, and make data-driven decisions around performance improvements, often reducing expenses and freeing up capital for additional sustainability initiatives.

Sphera explained that the company develops its R&D strategy with direct input from clients. In 2019, their clients managed an average of 1,050 KPIs within the software, a significant increase over previous years. Corporate Sustainability Software's big data processing technologies allow sustainability implementation for large clients so they can keep up with the challenges and complexities of sustainability management, Sphera said. The company added that it has invested in features such as automated, algorithm-based gap filling, which automatically increases the quality of the underlying information by recognizing data gaps and automatically filling them.

One large client is using Corporate Sustainability Software for their enterprise sustainability management solution, Sphera reported. This client wanted to establish key processes and governance to collect, manage, analyze, and report key operational and facility information...
WHAT THE JUDGES SAID...

“Improved data quantity and reporting speed as well as faster insights and better decision-making for large global clients.”

on energy, water, waste, and capital projects. Prior to using the software, the client’s data was coming from many different sources, and the collection was time-consuming, labor-intensive, and included potential risks for error. With the software, however, the client improved data quantity, reporting speed, and could provide faster insights and better decision-making.
Sphera's BOMcheck is a centralized blockchain web database for substances declarations. In order to sell products globally, manufacturers need to make sure that their suppliers understand, comply with, and stay current on substance regulations.

The BOMcheck system is updated with the strictest regulation for each relevant substance and provides tools, training, and chemicals guidance to help suppliers create and share standardized, high quality declarations. The blockchain ledger enables suppliers to manage their data securely and enables manufacturers to download auditable compliance declarations in industry standard IPC 1752A XML, PDF, or Excel formats. BOMcheck can be integrated to any PLM or ERP system and lets customers automatically send parts list requests to suppliers and onboard any new suppliers.

In January 2019, Sphera expanded BOMcheck to include new substance disclosure requirements in the EU Medical Devices Regulation. Substances in the Full Materials Declaration (FMD) tool are color-coded to show substances that are regulated around the world today and substances that are at risk of becoming regulated in the next few years, the company said. Confidentiality tools help suppliers control which customers have access to their FMDs, Regulatory Compliance Declarations (RCDs), or both. Suppliers can attach evidence documents to declarations.

Sphera said that BOMcheck screening assessments reduce supplier time and costs for REACH compliance by 60% by explaining why 106 of 201 REACH regulated substances are not present in supplied articles. For Proposition 65 compliance, assessments check 884 of 950 Proposition 65 regulated substances, producing 97% savings. The RCD tool provides chemicals guidance and a materials risk database to help suppliers investigate materials at risk of containing any of the remaining REACH and Proposition 65 substances, the company noted.
Based on the functionality and results, this product appears to be an effective, successful, and superior approach.”

Starting on January 5, 2021, all companies supplying products in Europe must report to the European Chemicals Agency (ECHA) Substances of Concern in Products database if they include articles that contain REACH regulated substances above 0.1%, Sphera said. In 2018 and 2019, BOMcheck represented the US electronics trade association IPC at workshops with ECHA to help clarify the database reporting requirements.

More than 1,000 manufacturers use BOMcheck to gather compliance declarations from over 10,000 suppliers worldwide for millions of parts. Supplier Belden Wire & Cable has said that said that the system helps them stay up-to-date with the rapidly increasing list of REACH Candidate List substances. Siemens Healthcare said that this is the first system that allows OEMs to reduce the industry burden of REACH and RoHS compliance by compiling a centralized master database of substance data from suppliers.
Sphera’s Life Cycle Assessment, previously called GaBi Envision, is a life-cycle assessment configuration software. The web application allows non-LCA-expert users to quickly understand and communicate their products’ sustainability performance, and compare alternative product designs by evaluating what-if scenarios, the software company said. Users can generate life-cycle assessments, environmental product declarations (EPD), EcoDesign, and other kinds of environmental footprinting.

Users outside of a sustainability or LCA expert team from departments such as product design or development, marketing, sales, or management often need access to a product’s environmental key performance indicators. They want to compare alternative materials, transportation routes, and production processes but typically don’t have the time or knowledge for comprehensive LCA software, Sphera said.

Life Cycle Assessment has an accessible web-based interface that helps users make comparisons by clicking and selecting parameters like materials, processes, energy, and transportation that have been previously defined in the product’s life-cycle model. Users can click a button to create an environmental report and share it with internal stakeholders in PDF or RFT formats.

Sphera said that the tool can be customized to match a specific industry or application. For example, a packaging calculator is tailored to the packaging industry’s materials and processes so that companies can calculate products’ circularity based on the Material Circularity Indicator (MCI). In addition, a server API of Life Cycle Assessment without a user interface allows people to use it as an automatic background calculation service for other tools.

Companies worldwide use Life Cycle Assessment to identify environmental hot spots and key
WHAT THE JUDGES SAID...

The tool allows product designers and engineers to quickly and accurately test the effects of different variables on products’ sustainability performance.”

parameters, Sphera said. Kimberly-Clark called the software “the perfect tool for moving LCA into the product development community.” Tesco said that the tool enabled the company to consider the environmental effects of the choices and decisions they make without over-complicating the subject matter. Packaging company Bio Futura praised the packaging calculator, and said that the overall tool enables them to identify the most sustainable and circular option available for products.  

2020 Environment + Energy Leader Awards
Loop is a circular shopping platform developed by the recycling company TerraCycle to address the global waste crisis by moving consumers away from single-use disposable packaging. Loop promises to eliminate waste by moving everyday product packaging from single-use to durable multi-use designs.

In early 2017, TerraCycle CEO Tom Szaky and executives from major consumer goods companies brainstormed ways for consumers to purchase products in reusable packaging. During the following two years, TerraCycle worked with companies to find brands willing to redesign their packaging to meet the platform’s durability standards. All Loop products get delivered in a collapsible padded tote made with insulation to keep food fresh and frozen. Although other reuse systems exist, TerraCycle says that Loop is the first system to apply reusability to diverse products such as shampoo, razors, and laundry detergent.

Brands participating in the first phase of Loop’s e-commerce model agreed to redesign their packaging to meet the platform’s durability standards. Everything in Loop, from the packaging to the supply chain, has been designed to be circular. The packaging and totes are reusable and, once taken out of circulation, the materials go through TerraCycle’s recycling process, the company said. Loop also accepts unusual items for recycling such as razor blades, small pieces of disposable packaging, safety seals, and wipes that can be sent back in the Loop tote.

The emphasis on reusability gives brands the ability to add features that wouldn’t be possible...
A ‘think big’ approach to the massive problem of packaging waste in a throw-away society. Bravo!

With disposable packaging, TerraCycle said. For example, Nestlé’s Haagen-Dazs Loop container uses double-walled steel that, when opened, melts ice cream more quickly at the top for better scooping and less freezer burn. Clorox repackaged their disinfecting wipes in a stainless-steel canister so consumers can return their used wipes in the Loop tote to be recycled along with the container.

Since Loop’s announcement in January 2019 and launch in May, TerraCycle says it has received positive responses. Within four months, 80,000 people signed up for the platform. Due to high consumer demand, six weeks after Loop went live, the platform expanded to six additional states in the US, for a total of nine plus Washington, DC, and additional zip codes in France. Loop has plans to launch in the UK, Germany, the US West Coast, Japan, Canada, and Australia. In each market, a circular supply chain is developed in conjunction with retail partners that include Carrefour France, Kroger, Walgreens, Loblaw, Tesco, Aeon, and Woolworths.
Turntide Technologies, formerly Software Motor Company, makes ultra-high-efficiency motors. The Smart Motor System includes the Smart Motor itself and the Motor Controller, and has networking and connection capabilities to the company’s cloud. Turntide Technologies said that the system can significantly reduce the energy consumption and demand of HVAC, refrigeration, pumping, and other applications where induction motors are in use. It also integrates with modern building management systems using industry-standard communications protocols.

More than 45% of the world’s electricity is consumed by motors, Turntide Technologies noted. In response, the company developed a unique high rotor pole, switched reluctance motor. The Motor Controller and its algorithms are unique to this patented Smart Motor, which is designed to optimize energy use across the entire speed range from 100 RPM to 3,600 RPM, according to the company.

Besides being more efficient at full-rated speed, the Smart Motor maintains efficient operation across the operating speed range. These switched reluctance motors run 50% more efficiently than standard AC induction motors on average, and 25% more efficiently than motors with variable frequency drives, Turntide Technologies said.

Each unit has its own IP address and connects to a control system that can be programmed to react automatically to environmental or other inputs. This enables the motor to run continually with optimal efficiency at optimal speed. Also, unlike standard motors, the Smart Motor does not use any rare earth minerals, according to the company.

Traditionally switched reluctance motor (SRM) design was applied in niche harsh operating environments due to its reliability, the company said. However, challenges such as efficient control, power density, high-cost electronics, torque ripple and vibration, and
Acoustic noise prevented commercialization for mainstream use. Turntide Technologies said that its patented technology uses computing power and software to solve these problems.

The company says that it has reduced electricity consumption by an average of 64% across their 60-plus initial deployments in commercial HVAC and refrigeration systems. Customers range from Five Guys to Sprouts Farmers Market. Field test results were validated by the US Department of Energy, the National Renewable Energy Lab, and the Western Cooling Efficiency Center, according to Turntide Technologies. In addition, the company formed a partnership with VES Environmental Solutions to build DairyBOS, an operating system for dairy barns that maintains optimal environmental conditions for cow health year-round.
The Vertiv HPL Lithium-ion Battery Energy Storage System is lithium-ion battery technology that has been optimized for data center customers. Vertiv designed it for uninterruptible power supply (UPS) systems in data center applications to help customers improve total cost of ownership (TCO), reduce operational expenses, and improve system reliability and availability.

Lithium-ion batteries can lower the total cost of ownership by as much as 50% for a typical application compared to valve regulated lead acid (VRLA) batteries, according to Vertiv. The company says that its HPL system provides data transparency through continuous monitoring, and is much smaller and lighter than VRLA battery alternatives, which helps data centers meet their operational and energy management goals.

The Vertiv HPL Lithium-ion Battery Energy Storage System has key benefits of lithium-ion technology — smaller size, lighter weight, lower cooling costs, reduced maintenance requirements, and less frequent replacement — in a system designed for data center UPS systems, the company said. It also has a monitoring system that provides real-time information about battery health so that data center managers can address battery operation trends before they become a problem that affects continuity. The Vertiv HPL battery cabinet has a redundant battery management system architecture and an internal power supply, which means it can be used for new deployments or as a replacement for in-service dry or wet cells.

VRLA batteries traditionally used in data centers usually need to be replaced every four or five years, whereas lithium-ion batteries have a 15-year lifespan and should not need to be replaced throughout the life of a UPS, Vertiv said. In addition, lithium-ion batteries more stable performance, higher cycling capability, and can function at higher temperatures, according to the company.
Vertiv says that its system’s compact standard data center rack-sized cabinet saves data center space, an internal power supply for the monitoring system saves installation time and costs, and redundant architecture improves reliability. For fast system deployment, Vertiv ships its battery system to the customer factory-tested and pre-installed in the cabinet.

Since launching in September 2019, the Vertiv HPL Lithium-ion Battery Energy Storage System has been well received by customers, according to the company. The company said that 30 to 40% of their large UPS systems are sold with lithium-ion batteries. Some large colocation customers have announced transitions to 100% lithium-ion batteries in their facilities, and large hyperscale customers also are switching to the new technology in significant numbers, Vertiv said.
Enablon, a Wolters Kluwer business, produces risk management, ORM, EHS and sustainability management software. With the Enablon platform, organizations can identify environmental aspects such as air, water, waste, energy, and chemicals as well as the related health and safety of workers and assets.

By capturing, validating, and consolidating data from across their organization, customers can track environmental and sustainability KPIs and metrics, according to the company. The software can then be used to successfully plan and execute action plans to mitigate risk, improve performance, stay compliant, and drive positive change within the organization.

Several updates were developed in 2019. They include integrating OSIsoft PI with the Enablon Air Quality module, which allows faster and more consistent data integration and makes it easier to troubleshoot and comply with regulatory requirements. By using Enablon’s new Environmental Event Smart Cards, users can easily and quickly log an event in the Air Quality module through an intuitive form with the help of a smart wizard. An updated context-aware AI assistant called Enablon Juno uses natural language processing to suggest relevant action plans or controls to reduce the risk of incidents.

Enablon’s sustainability and air emissions management capabilities include setting goals, tracking objectives, planning initiatives, managing action plans with Gantt visualization, and out-of-the-box reporting to CDP, DJSI, and GRI. The out-of-the-box mobile solution serves more than 500,000 users across 70 customers, is available in 14 languages, accessible offline, and offers 11 native capabilities. The platform’s modular architecture enables interactions between applications while ensuring high maintainability and scalability, the company said.

Hundreds of global companies and millions of users
Combining key environmental, safety, and health metrics all into one program makes managers much more effective.”

rely on Enablon to minimize risk, increase worker safety, prevent incidents from happening, and achieve regulatory compliance. South Australia electricity distributor SA Power Networks replaced its legacy environment, safety, and operational risk management system with Enablon. Using Enablon Go, the average number of days to report an incident dropped by 3.1 days, according to Wolters Kluwer.

A global food and beverage corporation that uses Enablon Waste and Metrics applications reduced their total waste-to-landfill by 1% to 6.8% of total waste. The company also reported a reduction in total lost time incident rate across the business from 5.80 per 1 million hours in 2012 to 2.44 in 2018. In addition, a global mining corporation reduced its total energy consumption by 12.4 million GJ compared to 2017 and keeps reducing GHG emissions using the software. A global beverage company lowered the number of accidents involving its workers by 19% and those involving contractors by 23%, Wolters Kluwer said. The beverage company also reduced its total wastewater from production processes by 67%. 
Pearl Homes are mass-market production-built homes designed to generate as much energy as they consume. These net-positive energy homes and hospitality units create virtual power grids that result in a lighter environmental footprint and lower cost, the company says. Each one of the model homes must be LEED Platinum certified as well as have net-zero off-the-grid technology, smart home AI technology, modular velocity, durability, and adaptability. All Pearl Homes are built to withstand a Category 5 hurricane.

Pearl Homes formed a partnership with the German energy company Sonnen to use their 16-KWh SonnenBatterie storage system, allowing the homes to store excess solar energy for use at night or to share it with the Pearl Homes community and the entire grid. When fully charged, the battery can completely power the home for 24 hours if there’s no solar production. The model homes are tied to Florida Power & Light’s grid, but only to draw power when the battery is down to 4%, according to the company. The Sonnen battery is used as daily cycle energy source, not just a backup storage unit, Pearl Homes said.

A Pearl Home is powered by a 6-KW solar array. Every roof has 16 south-facing 385-watt Jinko solar panels. The company noted that onsite renewal generation is fed through a Sunny Boy 6.0 inverter mounted outside. Generated power is converted to AC power and channeled into a main service panel to fully power the house. Inside, all of the appliances are electric and highly energy efficient, according to Pearl Homes.

In 2015, Pearl Homes became one of the first production builders to achieve LEED Platinum certification for 158 homes in Mirabella, a community in West Bradenton, Florida, for people who are 55-plus. More recently, in 2019, a Pearl Home model resort unit in Hunters Point, Florida, received recognition for being the first single-family home in the world to

[continued on next page]
WHAT THE JUDGES SAID...

Through the results of this project, Pearl Homes balanced the energy and environmental benefits to create an industry-leading standard. Very impressive work.”

receive LEED Zero certification. Mahesh Ramanujam, president and CEO of the US Green Building Council, called the project an example of sustainability that demonstrates the power of the Pearl Homes leadership in transforming the homebuilding industry.
The United States Marine Corps Recruit Depot (MCRD) on Parris Island in South Carolina tapped energy company Ameresco in 2015 for a comprehensive energy infrastructure project to optimize energy resiliency. The 8,095-acre MCRD Parris Island campus trains more than 20,000 recruits annually and its operations are mission-critical for national security, Ameresco said.

Financed by an energy savings performance contract, Ameresco deployed combined heat and power (CHP) and solar photovoltaic generation, installed an advanced battery energy storage system and automated microgrid control system, and implemented energy conservation measures to optimize efficiency and reduce reliance on the main utility grid.

To secure the energy savings performance contract to cover the cost of the $91 million project, Ameresco led the application process and worked with Parris Island officials as well as their financier. Ameresco’s lead engineer organized multiple site visits and worked through several question-and-answer rounds to secure approval of the contract, and to brief its progress during implementation. This approach enabled the project to move forward in a budget-neutral manner, Ameresco said. Parris Island is also in a hurricane prone area of South Carolina so the engineering team had to account for extreme weather in their design.

After six months of evaluation, design, and procurement, the project team broke ground in December 2016. The project’s microgrid control system (MCS) can monitor and coordinate the dispatch of electricity across the campus from the CHP plant, solar PV assets, battery energy storage system, and plant back-up generators. The MCS allows for nearly instant separation from utility power so that MCRD Parris Island can literally “island” itself from the utility grid during an extreme weather event or service disruption, Ameresco said. This was demonstrated during a live test where the customer “flipped the switch,” disconnecting the site from utility power. The site seamlessly transitioned to its own solar and CHP systems, augmented by the battery, according to the company. These resources were re-synchronized and connected back to the utility at the

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WHAT THE JUDGES SAID...

The project successfully provided sustainability benefits and mission continuity at a critical training location. This is clearly the model that should be followed in the future.

Ameresco replaced the existing end-of-life steam plant with a fully automated multi-fueled CHP plant capable of producing 3.5 MW of electricity in addition to the site’s full steam requirements. Solar PV arrays added 6.7 MW of onsite generation capacity, bringing the site’s overall capacity to more than 10 MW. A 4-MW (8.1MWh) lithium-ion battery energy storage system captures excess PV energy generation — more than 1,120,000 kWh — and stores this electricity for later use. An automated MCS capable of fast-load shedding distributes energy across the campus. In addition, Ameresco retrofitted more than 29,000 lighting fixtures with LEDs, upgraded aging chillers, deployed new HVAC control schemes, and updated the commercial laundry system. These measures ensure an always-on power supply and reduce 37,165 metric tons of CO2.

MCRD Parris Island now has more than 10 MW of onsite renewable energy and will save $6.9 million annually in operations and utility costs. Ameresco reported that there has been a 75% reduction in energy demand and a 25% reduction in water consumption on campus.
Bowery Farming is a New York City-based company that specializes in vertical indoor farming. Compared to traditional farmland, their farm in Kearny, New Jersey, uses 90% less water, nearly eliminates transportation emissions, requires no pesticides, doesn't contribute to nutrient pollution, and is 100 times more space efficient, according to the demand-side energy management company CPower Energy Management. Bowery Farming achieves this by using electricity for lighting, HVAC, and other processes.

Indoor agriculture operations require energy systems that alleviate the resilience, cost-effectiveness, and sustainability issues associated with their new electricity consumption in order to become a scalable solution. To address these issues, Bowery chose Scale Microgrid Solutions as their energy infrastructure partner. Scale's microgrid offers energy resiliency via full-load, grid-independent distributed generation. Zero upfront capital requirements along with utility bill savings and grid-services create cost effectiveness, CPower said. In addition, solar PV generation, avoided line losses, the replacement of backup diesel generators, and an ability to assist the grid when it's most stressed help achieve sustainability.

The microgrid comprises three distributed energy resources: 150-KW solar PV, 200-KW battery storage, and an 815-KW standby natural gas generator. Scale designed a behind-the-meter system that utilizes a combination of photovoltaic solar panels, lithium ion batteries, and a natural gas standby generator outfitted with advanced emissions control technology.

Scale built, owns, and operates the microgrid, allowing Bowery to procure benefits via a long-term microgrid services agreement. The system enables mission-critical operations to continue during power quality events and utility outages, which was tested during its first year of operations. CPower Energy Management integrated a grid services
WHAT THE JUDGES SAID...

An excellent proof-of-concept project that launches microgrid-as-a-service. Immediate energy, cost, and sustainability benefits.”

strategy during the design phase that identify additional cost-saving opportunities, improving the project’s economic and sustainability profile.

The microgrid system delivers 1.165 MW of grid-independent electricity, which helped Bowery Farming reach its resiliency goal. A long-term microgrid services agreement required no upfront capital or maintenance costs, and generated cost-effectiveness through grid-services strategies and lower utility bills. All of the electricity produced by the solar array reduces Bowery’s utility consumption, while dispatched power from battery storage and the standby natural gas generator reduces the need for GHG-intensive dispatchable power from central peaking power plants and diesel backup generators.
Data center, colocation, and interconnection solutions provider Digital Realty established a global water strategy to better understand their “hydro-footprint” and take measurable steps to reduce it.

The company started by establishing a goal to identify regions and watersheds where water scarcity and quality have the potential to pose the largest operational risk to their business. As part of their larger sustainability strategy, they identified water usage as an area where they could quickly make a tangible difference. Digital Realty identified and vetted projects, processes, and programs with reduce, reuse, or recycle strategies that could be executed at a site level to optimize potable water consumption, shift to the use of non-potable water sources, and build additional resiliency and redundancy into operations.

Water plays a big role in their operations, Digital Realty said. This project looked at water usage throughout the company’s footprint, including in their facilities, equipment, and supply chain. It also examined how Digital Realty could use less and recycle or eliminate water usage. Now the company says that it leverages reclaimed water for cooling for more than 35% of their water usage, and has implemented technology and modeling for treatment programs to optimize water usage, reducing the amount of water being discharged to the local watersheds.

Although the company reported already having a strong track record of responsible water use and conservation, their global water strategy extends these efforts. For example, Digital Realty said that it is pioneering the use of cooling systems that do not use water, and the company is utilizing reclaimed water extensively to lessen effects on local water supplies.

Since the start of the program, the company deployed more than 344 MW of cooling systems to deliver high levels of energy efficiency, saving
WHAT THE JUDGES SAID...

An out-of-the-box plan to apply reclaimed water to cooling systems. Kudos!

1.03 billion gallons of water per year. Digital Realty also expanded their partnership with water treatment and process improvement company Nalco Water to implement water treatments solutions that optimize water use, ensure efficient heat transfer, and minimize energy consumption throughout Digital Realty’s data center portfolio.
Global specialty materials company Eastman noted that only 9 to 12% of the 3 million metric tons of plastics produced globally actually gets recycled. At the same time, many brands set aggressive goals for increasing their recycled plastic content, which they won’t reach without a higher recycling rate. In response, Eastman developed carbon renewal technology (CRT) that breaks down waste plastics into molecular building blocks — like carbon, oxygen, and hydrogen — and turns these blocks into new virgin-quality plastics.

CRT provides an end-of-life solution for many plastics such as single-use plastics, textiles, and carpet that traditional mechanical recycling methods cannot process, according to Eastman. The goods produced from this technology can be infinitely recycled through the same process, creating a fully circular model and a reduction in virgin materials needed globally, the company said.

Eastman launched the technology in October 2019 by modifying the front end of its acetyl and cellulosic manufacturing process to accept waste plastic feedstocks. In November the company said that it began acquiring post-consumer carpet as a feedstock through an agreement with Circular Polymers. Eastman anticipates that this agreement will divert millions of pounds of carpet from landfills and give new life to those materials in the form of plastics that can be used for durable applications. The company expects to use as much as 50 million pounds of waste plastic in carbon renewal technology operations in 2020, and projects have already begun to expand that amount over the next few years.

Many companies talk about chemical recycling technologies, but they’re often years away from being at scale or they’re limited to only recycling one or two types of plastics, Eastman said. The CRT approach can recycle virtually any waste plastic, and the technology is in production now, according to the company.
By incorporating waste plastics into its production, Eastman said that it is reducing the amount of fossil feedstocks required to make products. CRT breaks waste plastic down to the molecular level in the same manner as fossil feedstocks. According to an initial life-cycle analysis by Eastman scientists, CRT can reduce the carbon footprint of its plastics production by as much as 40%. The company expects CRT to generate $2 million to $300 million in new revenue in the next few years.
A heating, air conditioning, and refrigeration solutions manufacturer operates a large manufacturing plant for producing their residential condensing units in the United States. This facility is spread across an area of 900,000 square feet and produces more than 1.2 million units annually. Facing multiple challenges in maintaining efficient operations, the manufacturing plant worked with EcoEnergy Insights to address them.

Frequent HVAC equipment breakdowns at the plant increased the operational cost and negatively affected occupant comfort. Difficulty in identifying issues with the equipment’s performance prevented prompt repair work, hampering the plant’s overall efficiency. The facility wanted to reach its sustainability target of a 3% reduction in GHG emissions. The complexity of the manufacturing process as well as the distributed layout of equipment intensified the challenge.

EcoEnergy Insights liaised with the plant’s engineering team to understand the operations. They reported studying data from all existing building automation and energy management systems. The team deployed their IoT platform, called Cortix, along with skilled analysts, focusing on strategies to reduce operational costs for maintenance and energy, and improve occupant comfort and safety to help the plant achieve its sustainability goal.

Data from all equipment and systems at the plant was fed to the software, which processed more than 700,000 data records per day from over 8,200 unique data points. The platform provided actionable insights on three aspects of the equipment’s performance: health, availability, and efficiency. Using these insights, the team discovered energy improvement scenarios.

Over the course of six months, EcoEnergy Insights said that the plant achieved a 6.3% average reduction in CO2 emissions compared to the
EcoEnergy Insights uses a building IoT platform to reveal deep insights. In the digital transformation era, this is how tough sustainability problems will be solved.

yearly sustainability target of a 3% reduction in GHG emissions. The Cortix platform predicted issues that could lead to an equipment failure, which made the plant’s maintenance processes proactive. For example, AI-based algorithms helped the plant maintenance team reduce chiller breakdowns to just one during the six-month period.

Using the platform, the EcoEnergy Insights team discovered energy wastage scenarios and implemented more than 30 HVAC controls-based strategies. Work lists, fortnightly summaries of deviations, and recommended improvisations were submitted to the plant team. The recommended actions provided in the work lists were carried out by the plant’s technicians or remotely by the EcoEnergy Insights team. The January to June 2019 results were a 5.5% average energy savings, a 9% average reduction in gas consumption, and a 22% improvement in thermal compliance.
Energy solutions company Enel X began construction on a behind-the-meter project that includes solar power, battery storage, and electric vehicle charging stations at the University of Massachusetts Boston campus in the second half of 2019.

Massachusetts is one of the states advancing the use of battery storage, creating growth opportunities for hybrid projects like solar plus storage, according to Enel X. As the company’s first solar plus storage system in the market, the UMass project received a grant from the Advancing Commonwealth Energy Storage program through the Department of Energy Resources and was administered by the Massachusetts Clean Energy Center in 2017. The project also taps into the state’s new Clean Peak Standard, which provides incentives for renewable energy technologies that supply electricity or reduce demand during peak periods, Enel X said.

The project includes a 1-MW rooftop photovoltaic system combined with a 0.5 MW/2.0 MWh battery storage, and 11 Enel X JuiceBox electric vehicle smart charging stations. The rooftop solar facility should produce more than 1,200 MWh annually of renewable energy, contributing to Massachusetts’ goal of becoming net-zero by 2050, according to Enel X. The EV charging stations use cloud software to monitor and adapt to changes in the local energy market so that charging can be adjusted based on renewable energy availability or energy costs. The company said that its Distributed Energy Resources Optimization Software, paired with machine learning technologies, allows the system to predict energy load and optimize energy usage, preventing stress on the electrical grid.

Enel X said that commercial solar developer EnterSolar was a key partner in the PV development. The project is part of the Solar Massachusetts Renewable Target (SMART) Program, which compensates behind-the-meter solar power capacity and creates...
Combined photovoltaics and storage for peak shaving and electric vehicle charging are the way industry is moving — and should continue to move.”

opportunities for C&I energy users to integrate solar plus storage systems cost-effectively.

The solar plus storage project should reduce the campus’s electrical grid dependence and energy spending by more than $1.5 million over the life of the project once it’s operational, Enel X said. The company added that its collaboration with UMass allows the university to demonstrate leadership on generating and storing renewable energy this way. In addition, Enel X anticipates that the hybrid system will serve as a living laboratory for UMass students.
Nonprofit real estate organization Urban Land Conservancy (ULC) owns Oxford Vista, a 31-acre property in southeast Aurora, Colorado, that serves as the AmeriCorps NCCC Southwest regional headquarters. ULC seeks to ensure that AmeriCorps, their tenant, has a below-market rental rate. The organization formed a partnership with national energy service performance contractor EnergyLink to design and build the energy redevelopment of the campus.

Prior to the project, Oxford Vista was an outdated, inefficient 1960s property. EnergyLink said that a modern variable refrigerant flow (VRF) heating and cooling system is replacing old, failing HVAC equipment and will connect to a 75-well closed-loop geothermal bore field. This should reduce the energy requirements of running the variable refrigerant volume (VRV) system as well as reduce dependence on natural gas for heat in the winter.

In addition to these facility improvements, plans call for upgraded windows plus adding a white thermoplastic polyolefin (TPO) cool roof and a 440-KW ground-mount and carport solar array. Having net-zero electric consumption would be beneficial for Oxford Vista, AmeriCorps NCCC, the community of Aurora, and the utility Xcel Energy, EnergyLink said.

By integrating onsite generation into building control systems that control HVAC systems, the facility can reduce peak electric demand that ordinarily occurs as a result of uncontrolled cooling loads being triggered simultaneously during the heat of the day, according to EnergyLink. By monitoring solar production and building loads in real time, the building controls autonomously juggle cooling loads to limit the instantaneous peak demand, yielding considerably larger economic benefits to the customer than efficiency or generation measures alone, the company added.
WHAT THE JUDGES SAID...

An impressive and well-managed project with a holistic approach that brought today’s energy management best practices to 1960s-era facilities.

EnergyLink said that the project at Oxford Vista Campus should reduce the facility’s natural gas use by approximately 1,900 therms per year. The mechanical system upgrades and the automation system should see a peak electric demand reduction by 50 to 100 KW every month of the year compared to a scenario in which a like-for-like replacement of old equipment was prescribed, according to EnergyLink. The half a megawatt of PV solar should reduce energy dependency on the grid by approximately 1.2 million KWh annually, making total electric consumption roughly net zero. The company said that this takes a huge load off Aurora’s electric grid, helping the city and Oxford Vista’s tenants. 

2020 Environment + Energy Leader Awards
Electric and gas utility Exelon is the nation’s largest generator of carbon-free energy. Over the past eight years, they have distributed free trees to their customers through a partnership with the Arbor Day Foundation’s Energy-Saving Trees program. In spring 2019, Exelon distributed 8,600 trees, surpassing 100,000 trees total.

Free tree distributions take place in six major urban markets and use technology to show homeowners how trees can be a solution to energy efficiency and lead to financial savings. The trees help reduce energy use and peak demand through summer shade and winter windbreak in addition to providing other environmental and community benefits.

The Arbor Day Foundation creates custom websites for each utility’s specific project. For Exelon, the tree website invites the utility’s customers to reserve free trees through an interactive experience. The homeowner sees an aerial view of their property, and the software helps them identify the ideal location to plant their tree for maximum energy and environmental benefits, away from utility lines.

Customers receive their trees either through the mail or at pickup events organized by local Exelon utilities. The Energy-Saving Trees program automatically tracks tree reservations and participants, managing tree inventory and providing environmental metrics for all trees ordered. Powered by i-Tree, the software uses scientific research to provide comprehensive program reports. This technology calculates environmental benefits for each tree: air pollutants absorbed, stormwater filtered, and carbon sequestered as the trees mature.

Energy-Saving Trees provides Exelon a way to engage positively with customers, helping them decrease energy usage. Throughout the eight years that Exelon has participated in the program, the utility has engaged 66,823 customers and distributed 102,858 trees. These trees are projected...
WHAT THE JUDGES SAID...

A fantastic community-engaged approach to reducing pollution, preserving water, and lowering energy costs for customers.

to provide $29.4 million in electric savings over the next 20 years through shade and windbreak, filter 2.2 billion gallons of stormwater, sequester 470 pounds of carbon, and absorb 1.5 million pounds of air pollutants. Collectively, these trees should provide $60.5 million in environmental benefits. This partnership earned Exelon a place on Arbor Day Foundation’s Evergreen Alliance, where they are members with 16 corporate partners that are helping the Arbor Day Foundation reach its goals of planting 100 million trees by 2022.
FETZER VINEYARDS
LEVERAGING THE INTERNET OF THINGS AND BIG DATA TO STAY STEPS AHEAD OF WATER WASTE

Citing data from the World Economic Forum, California winery Fetzer Vineyards recognizes water as a top risk. The winery has focused on reducing its water intensity for decades. In 2017, Fetzer Vineyards installed cloud-based water metering technology from the Bellingham, Washington-based company Apana to quickly detect leaks and waste water incidents in real time. Using IoT technology with their water stewardship program allowed the winery to reach their 2020 water efficiency goal early.

The winery’s approach to reducing water intensity involved analyzing a host of interrelated systems. Nearly every water-using application and process across their Hopland, California-based campus required monitoring to achieve reductions. Using a combination of precision meters and Apana IoT devices, water at Fetzer Vineyards gets continually monitored and measured from more than two dozen endpoints, while seven “virtual” sensors collect data from other key functional areas. Data is collected in real time from wells, cooling towers, red and white barrel rooms, crossflow, bottling, refrigeration, and maintenance operations.

Fetzer Vineyards said that, with visibility into specific functional areas, they can immediately respond to waste events, compare current use against historical benchmarks, and strategically plan for future production cycles. Besides relying on cloud-based water metering technology, they also use worms and microbes to treat wastewater efficiently. The ongoing use of peracetic acid in the winery eliminates the need for a second rinse during sanitation, while upgrades to the winery’s centrifuge system to recirculate cooling water have reduced the water required during a key winemaking process.

As the largest B Corp winery in the world, Fetzer Vineyards said that it actively participates in water policy initiatives, including advocating for the
Fetzer effectively reduced water usage per gallon of wine made, which adds up to better environmental stewardship.

The winery aims to use technology to achieve their sustainability goals and manage water the way they manage other assets, like inventory. Since 2015, they decreased their water intensity by almost 25%, from 3.65 to 2.75 gallons of water used per gallon of wine produced. The use of cloud computing to monitor water leaks was a key driver in their ability to reduce water intensity and exceed their 2020 water reduction goal by 10% two years ahead of schedule. And, because energy use is closely tied to water use, this technology contributed to a reduction of more than 10,000 KWh of energy in addition to saving millions of gallons of water annually.
Colorado-based PDC Energy is an independent crude oil, natural gas, and natural gas liquids exploration and production company. They are subject to strict and complex compliance requirements across their approximately 1,000 facilities, said cloud-based EHS software company Intelex.

PDC Energy was looking for air emissions management software that could handle numerous compliance and reporting frameworks, and accommodate unique compliance processes when needed. The company selected the Intelex Asset and Compliance Tracking System (ACTS). They used ACTS to create a one-off compliance process for a vapor control systems EPA consent decree via PL SQL coding. In addition, PDC uses the software for more standard compliance items such as SARA Tier II reporting, carbon emissions reporting, flare line blowout inspections, storm water inspections, and SPCC management.

Intelex said that ACTS helps customers facilitate conformance with all types of air, water, and waste regulations and reporting frameworks. ACTS integrates a calculation engine, sustainability performance indicators, air emissions management, water management, and waste management with permits management, corrective and preventative actions, and audits and inspections. The software can be configured with no changes to the source code, Intelex added.

One of the air emissions regulations that PDC Energy must comply with is a consent decree with the EPA regarding vapor control systems, Intelex said. The consent decree requires constant monitoring of that vapor control systems and a site inspection within 24 hours if a high reading is registered. PDC also needed a system up and running in just four months.

Intelex said that the framework and workflow was successfully completed in four months, and
PDC Energy faced multiple complexities, and successfully completed their implementation project on time. There is a real benefit to tracking sustainability indicators.

optimized for the following 14 months. Using Intelex ACTS, PDC met their compliance goal by implementing a system that records measurements from a supervisory control and data acquisition (SCADA) system every 15 seconds. In the event of a reading that exceeds a set threshold, ACTS automatically creates and schedules an inspection while simultaneously sending the relevant inspection forms to the correct employee. If corrective actions are required, they are created and tracked to completion within ACTS.
Infosys, one of the largest technology services company in India, has large campuses in more than 15 major cities throughout the country. The company manages a portfolio of 200 buildings and a built-up area of 35 million square feet. Infosys used the Johnson Controls Enterprise Management platform to receive advanced automated fault detection and diagnostics along with integrated work orders, allowing them to improve efficiencies and optimize operations across the 21 buildings at their headquarters.

Infosys implemented the Johnson Controls Enterprise Management platform and four of its applications. The Energy Management application allows the tracking, analysis, and management of various types of energies as well as the ability to forecast energy usage in advance and adjust behavior accordingly. Data Visualization Widgets allow the user to predict, prioritize, perform, analyze, manage, question and share information. Financial Health and Utility Bill Management enables users to track and manage each enterprise with a broad view of costs and returns related to utility consumption. The Asset Performance & Maintenance Management application uses fault detection and diagnostics to generate and track work orders.

Using these applications, Infosys validated nearly 1,000 faults in their building management system in the first three months of operation, detected 7,000 alarms every 15 minutes and shared diagnostics, identified faulty zone temperature sensors and sources of water waste, and utilized a water per capita dashboard to receive insights about occupant-based consumption.

Johnson Controls reported that Infosys seamlessly integrated their disparate building systems with Enterprise Management’s BAS-agnostic applications, and was able to take a more systematic approach to building management. Through this integration, Infosys is working more collaboratively...
across teams, as well as utilizing the AI and machine learning FDD engine to support their teams. In addition, Infosys’ Green Initiatives program takes building data from analytics such as baseline tracking, forecasting, and zone-wise energy distribution trends to produce actionable insights for saving money and streamlining operations.

By installing Enterprise Management, Infosys processed and closed 1,200 work orders, according to Johnson Controls. Through this project Infosys also established a system for tracking consumption of energy-intensive equipment and now continuously monitors each building’s electrical consumption, electrical peak demand, and water consumption. As a result, the company achieved 32,000 KL in total water consumption savings for the Phase 2 campus in 2019. They also captured trends in peak demand values for each building.

WHAT THE JUDGES SAID...
The project yielded significant savings in total water consumption, and captured trends in peak demand values for each building.”
Aerospace, defense, arms, security, and advanced technologies company Lockheed Martin’s location in Moorestown, New Jersey, had heat distributed from a centralized steam plant to numerous buildings for 65 years. The steam developed at this centralized location was then piped throughout the nearly 1.16 million-square-foot site to serve building heating systems, air handler coils, and steam unit heaters. This steam also provided heating for a 280,000-gallon water tank.

In a multi-phased project implemented over six years and completed in 2019, Lockheed Martin replaced the centralized steam plant with a distributed system of high-efficiency condensing boiler plants in several buildings to optimize efficiency and reduce the energy required to heat the site.

The project was identified during the site’s energy structured improvement activity event, where experts from across the corporation worked directly with the site’s facilities team to identify the most promising energy-saving opportunities. A funding and execution plan was then developed, and the project began in 2013 with the first phase, which allowed for the central steam system to be deactivated in the summer months, Lockheed Martin said. This approach helped the project to get off the ground with available funds while allowing the site team to gain confidence in the project’s overall premise.

During the next six years, the centralized steam plant was replaced with a distributed system of high-efficiency condensing boiler plants in several buildings to optimize efficiency and reduce the energy required to heat the site. The project involved close coordination between the site facilities project team, design engineers, contractors, and site programs to make sure that the site’s missions, and those of government customers, were not affected.
WHAT THE JUDGES SAID...

This project speaks directly to building efficiency. It could be used as an example for designing new installations, or where existing equipment requires replacement.

The project’s gradual implementation enabled a drastic change to a key site service to be embraced and supported by even the most ardent skeptics, Lockheed Martin said. Successfully turning off the central steam in the summer showed the facilities and site teams removing central steam from the site could be achieved.

Decentralizing the boiler operations and updating the equipment and controls means that the boilers no longer operate on a 24/7 basis. Now energy for heating is used only when required. Piping repair and replacement costs from the centralized steam plant have been mitigated as well. This large-scale update, which cost $2.5 million, resulted in an annual cost avoidance of $518,000 and an annual energy avoidance of 17,580 MMBTU, reducing the site’s consumption of natural gas by 24%, Lockheed Martin said.

2020 Environment + Energy Leader Awards
Lockheed Martin’s RMS Troy, Alabama, site agreed to take on the Energy Star Challenge for Industry in 2017. The challenge requires reducing energy intensity by 10% within five years. With help from Energy Star and building modeling using regression analysis, Lockheed Martin said that the site measured the effect that production changes, weather, and energy-efficiency projects had on energy intensity. These three factors were used to predict energy consumption at the site with a high degree of confidence, according to the company.

After the site agreed to do the Energy Star Challenge, they began working on reducing energy usage. Projects to reduce energy consumption at the RMS Troy site included compressed air consolidation, leak detection, weekend shutdowns, and a lighting project that replaced thousands of fixtures with LEDs. To support the multivariate regression modeling efforts, the site collected and submitted various elements of production data, verified the closest appropriate weather station, and helped analyze various rounds of modeling results, according to the company.

The multivariate regression modeling allowed Lockheed Martin to remove, or “normalize,” the effects of weather and production increases and decreases to get a clearer picture of true efficiency gains and losses. The company said that the site has a great model for measuring energy trends moving forward. Troy’s model was developed to compete in the challenge, which called on participants to reduce their energy intensity by 10% within five years. RMS Troy achieved it in one year with a 23% reduction.

The projects at the site reduced electricity consumption by about 970,000 KWh per year and avoided more than $75,000 annually. These reductions helped the site meet Lockheed Martin’s overall Go Green 2020 goals of 25% energy reduction and 35% carbon reduction from a 2010 baseline. In 2019, the EPA recognized the site as an Energy Star Challenge Achiever.
WHAT THE JUDGES SAID...

“
The site exceeded energy reduction goals well before the deadline, and set the stage for ongoing improvement. They nailed it.”

2020 Environment + Energy Leader Awards
MilliporeSigma created the free web-based greener alternative scoring matrix Dozn 2.0, which is a quantitative green chemistry evaluator based on the 12 principles of green chemistry to increase sustainability in scientific research. These 12 principles provide a framework for learning about green chemistry and designing or improving materials, products, processes, and systems, the company said.

Dozn 2.0 scores products based on metrics for each principle and aggregates the principle scores to derive a final aggregate score. The system calculates scores based on manufacturing inputs, globally harmonized system (GHS), and safety data sheet (SDS) information. MilliporeSigma said that this provides a score for each substance and encompasses a diverse portfolio ranging from chemistry to biology-based products. Customers can screen their processes securely utilizing Dozn 2.0. Then, based on the Dozn 2.0 scores, customers can modify their processes to improve energy usage, hazards, and overall sustainability.

The tool groups the 12 principles into like categories, allowing for a focus on the overarching categories of hazard, resource use, and energy efficiency to calculate greener scores on a scale from 0 to 100, with 0 being the most desired. Dozn 2.0 has been verified and validated by a third party to ensure best practices, and a peer-reviewed paper has been published in the journal ACS Sustainable Chemistry & Engineering, MilliporeSigma said.

During phase one, MilliporeSigma evaluated 50 re-engineered products and processes, and then compared them with the original processes’ scores. One product example is 1-Aminobenzotriazole. For waste prevention, the original process score was 2,701. The re-engineered process score was 1,042, meaning organic solvent usage was reduced by 40%. For “less hazardous synthesis,” the original score was 3,358. By eliminating a hazardous hydrogenation step, the re-engineered process scored 1,455.
WHAT THE JUDGES SAID...

Scientists can calculate the green scores of their own processes and products. The results: improved resource use, increased energy efficiency, and reduced human and environmental hazards.”

The original score for energy efficiency was 3,282. Eliminating elevated temperature usage dropped the score to 1,322. The aggregate score went from 100 to 44, representing a 77% environment and energy improvement overall.

MilliporeSigma launched Dozn 2.0 as a free web-based tool to customers. Currently about 150 customers are using the tool to screen their processes, the company said. MIT is one of the highest registrants employing Dozn 2.0 to improve their overall sustainability.
American enterprise information management services company Iron Mountain collaborated with wholesale electricity supplier NextEra Energy Resources and renewable energy development company Black Bear Energy on a 6.9 MWdc/5.4 MWac solar project. The project, which will be owned and operated by NextEra Energy Resources, should help Iron Mountain reach its goal of sourcing 100% renewable electricity 24/7 from local resources.

Iron Mountain’s clients can benefit from the renewable power through the company’s Green Power Pass program, which launched in February 2019 and gives customers the ability to include the power they consume at any Iron Mountain data center in their CDP, RE100, GRI, and other sustainability reporting. To claim these benefits, data center customers use a protocol established by the Future of Internet Power for the industry. This represents the collaborative efforts of the Renewable Energy Buyers Alliance (REBA) and the Business for Social Responsibility (BSR), NextEra Energy Resources explained.

Iron Mountain worked closely with Black Bear Energy on the sourcing, design and implementation of the project. Black Bear Energy put the project out to bid and presented the bid results from multiple solar developers to Iron Mountain. NextEra Energy Resources, which Iron Mountain selected to develop and implement the project, began construction just one month after the contract signing.

The 6.9MWdc/5.4MWac NJ project is the largest rooftop solar installation on any data center in the United States, setting the standard for other data centers, NextEra Energy said. The project incorporates the use of bifacial panels, which increase production by allowing light to enter from both sides of the panel, and uses optimizers to increase efficiency. Data centers are critical environments with no tolerance for risk, so the project partners said they collaborated...
Iron Mountain and their data center customers must be thrilled that the project was implemented so quickly, on such a large scale, and with no disruption to the data center’s business function.”

extensively on designing and constructing a large rooftop system during a short timeline that would follow data center protocols.

Once complete, the project should enable Iron Mountain’s New Jersey data center to achieve unprecedented levels of solar power during long summer days when cooling loads are highest — and provide a local solution for data center customers participating in the Green Power Pass program, NextEra Energy Resources said. The onsite solar power purchase agreement is part of Iron Mountain’s mission to obtain local, reliable, cost effective, 24/7 renewable energy solutions to meet the company’s RE100 goal of 100% renewable electricity for global operations. When operational, the solar project is expected to generate 9 million kWh per year. 

2020 Environment + Energy Leader Awards
Electric distribution cooperative South River Electric Membership Corporation, South River EMC for short, and its power supplier, North Carolina’s Electric Cooperatives formed a partnership with Butler Farms, a sustainability-focused hog farm in Lillington, North Carolina, to develop a microgrid. They selected PowerSecure as the project’s engineering, procurement, and construction contractor to collaborate on the design and commissioning of the project.

The project improves the reliability of the electric system and farm operations by avoiding prolonged outages after interruptions to grid power, PowerSecure said. During normal conditions, the microgrid will connect to South River EMC’s distribution system to integrate local renewable resources, and supplement and diversify traditional power resources. During outages, it can operate in island mode to power Butler Farms and nearby homes. This project also serves as a case study for how agriculture and electric utilities, two important industries in North Carolina, can work together to promote sustainability and improve quality-of-life.

In 2008, to lessen the farm’s GHG emission and ammonia effects on neighbors and environment, Butler Farms installed covers over their four-acre lagoon area, PowerSecure explained. These lagoon covers capture anaerobically produced methane — biogas — to use as power generation fuel rather than allowing the GHG to go directly into the atmosphere.

The farm also installed a 20-KW solar panel array and has a 100-KW standby diesel generator that can supply a full system backup. In 2017, Butler Farms combined its existing biogas and power generation systems into a new microgrid in partnership with South River EMC and North Carolina’s Electric Cooperatives. PowerSecure installed a 250-KW/735-kWh battery storage system and microgrid controller to coordinate the components. This microgrid integrates local renewable energy resources, including solar and biogas, with energy storage.

The microgrid uses local low-carbon generator resources to provide grid flexibility and defers operation of the diesel generator during outages,
WHAT THE JUDGES SAID...
A fantastic example of how to grow an initiative to benefit the larger community. This kind of visionary community integration is key to escalating the clean energy conversion.”

PowerSecure said. The microgrid controller allows South River EMC and North Carolina’s Electric Cooperatives to initiate the microgrid and automatically isolate the farm from the larger electric distribution system. There are three reclosers: one that isolates the farm from the cooperative, and two on the utility line to isolate the surrounding area between the reclosers from the utility. The cooperative can dispatch the system during peak energy usage while connected to the grid to explore potential benefits of microgrids for demand response.

The project enabled a research partnership with North Carolina State University to analyze the relationship between battery life and its dispatch strategy. This research should help inform decisions on the deployment of future cooperative energy storage systems, according to PowerSecure. It is also part of a STEM learning initiative for elementary students. PowerSecure said that Butler Farms focuses on sustainability and supporting its local community, and this project contributes environmental benefits and enhanced power reliability for their neighbors. ☞
Canadian pulp, paper, tissue, and wood products manufacturer Resolute Forest Projects established a new thermomechanical pulp (TMP) biorefinery in Thunder Bay, Ontario. In partnership with FPInnovations, a private not-for-profit R&D organization in the Canadian forestry sector, the plant uses patented technology to turn wood-based chemicals such as lignin and cellulosic sugars into commercial products like adhesives, animal feed, and composites.

The company’s broader goal is to develop new ways to efficiently manufacture and market wood-based biochemical products, and to advance the bio-economy, which Resolute said is the opportunity to use renewable biological resources from land and sea, and convert them into energy, materials, and food. North America’s forests have biomass resources available in roots, trunks, and branches that can be converted into renewable bioenergy, biofuels, and other bioproducts that could replace fossil-fuel based products, according to the company.

In 2012, Resolute invested in a research collaboration with the Center for Research & Innovation in the Bio-economy (CRIBE), Natural Resources Canada, and FPInnovations to operate a lignin extraction demonstration plant at their Thunder Bay pulp mill. The company hosted a nearly $17 million biorefinery pilot plant at their Thunder Bay facility to test the large-scale production of biochemicals derived from wood. Then, in 2019, they commissioned the new TMP biorefinery plant, which the company said has the capacity to treat 100 metric tons of biomass annually.

Market interest for sustainably sourced green biochemicals continues to grow, according to Resolute. The company said that developing significant quantities of bio-sourced chemicals, such as the cellulosic sugars and high-quality H-lignin produced by the TMP biorefinery process, and making them available is a key step in growing
WHAT THE JUDGES SAID...

“A good example of private sector, government, and indigenous groups working in partnership.”

Resolute called the bio-refinery the first of its kind in North America, and one of the few operating worldwide. The company said that, by establishing this plant and pursuing new biochemical products opportunities, it aims to add value to North America’s forestry sector and support Canada’s efforts to be a global bio-economy powerhouse. Resolute added that its leadership in advancing the bio-economy and sustainable bio-products has won recognition from peers, particularly for their agreements with First Nations in Ontario for contracts that support biomass and biofuel businesses.
Saudi Arabian national petroleum and natural gas company Saudi Aramco said that water reservoirs far from the Gulf previously required significant quantities of non-potable groundwater for injection to help produce oil. In 1979, the company created a Sea Water Injection Department (SWID) to replace most withdrawals from this source. Since then, the department has been conducting annual projects to avoid consuming non-potable groundwater while reducing energy consumption and cutting GHG emissions.

Saudi Aramco founded SWID by commissioning the Qurayyah Sea Water Plant (QSWP) and an associated pipeline network. The company gradually replaced the requirement for non-potable groundwater with a series of expansions to the plant from 5.5 million barrels per day (MMBD) in 1978 to 7.0 MMBD in 1994 to 9.5 MMBD in 2005 and then to 14 MMBD in 2008. QSWP, however, consumes groundwater for utility and potable uses to avoid energy consumption for desalination as well as GHG emissions.

In 2019, SWID implemented three initiatives. QSWP shifted from continuous groundwater treatment to need-based intermittent operation, resulting in saving 64 million gallons. SWID also optimized the use of gas turbines to inject that seawater, resulting in 13,770 million SCF fuel gas consumption avoidance, and enhanced efficiency of pumps — among other equipment — to avoid over 100,000 MWh power consumption, Saudi Aramco said.

The company has a water treatment strategy map for annual projects that enables reductions in non-potable groundwater, energy, and GHG emissions. In 2019, Saudi Aramco implemented sulfate-removing facilities that make seawater compatible with more reservoirs, helping avert withdrawals of non-potable groundwater for pressure maintenance. The facilities use nanofilters that previously experienced flux loss due to the biocide chemicals that protect SWID's pipelines.
WHAT THE JUDGES SAID...

This project made significant environmental improvements in the way oil is obtained while conserving local groundwater that was previously being overtaxed.

from corrosion and leaks. Last year plant personnel collaborated with biocide service providers to formulate the first biocide mixtures compatible with membranes to protect pipelines over the long run.

QSWP’s cumulative maximum design treatment amounts to nearly 21,000 million cubic meters, according to Saudi Aramco. This non-potable groundwater savings equals more than 650 years supply of 2 liters of daily water intake for the current Saudi population, and around 15% of available groundwater in Saudi Arabia’s largest aquifer, the company said. The present design treatment capacity achieves as much as 812 million cubic meters annual groundwater avoidance. By comparison, the country’s total non-renewable groundwater withdrawals for the industry was 800 million cubic meters in 2016. SWID’s groundwater avoidance in 2019 represented a 55% drop from 2018.
Energy management and automation solutions company Schneider Electric has had a partnership with the College of Southern Nevada (CSN) for more than 20 years. The college’s Health Science Campus houses the state’s provider for its healthcare workforce. Faced with a nursing shortage in the Las Vegas area, the college needed additional classrooms and labs to accommodate their waiting list for enrollment. CSN also sought to standardize their energy efficiency and reporting.

The college integrated Schneider Electric’s EcoStruxure Building Operation 3.0, EcoStruxure Access Expert, Video Expert, lighting control, and Accutrol Precision Air Valves. The integration of the building management software and controls allowed the college to halve its annual energy bills and maintain energy standards across the campus, the company said.

Smart HVAC building automation systems control building environments through smart thermostats and EcoStruxure Building products. Access Expert security solutions and integrated CCTV monitoring help keep students safe. EcoStruxure Power Monitoring Expert monitors power usage and helps the campus meet energy savings and sustainability goals. The longtime partnership with Schneider Electric means that the college receives the benefit of using their existing investments, featuring centralized servers that control operations on each campus, including the new installations on the Henderson campus.

Schneider Electric said that it provides EcoStruxure products to CSN so students can learn on technology that they will encounter in the real world. The company’s employees help teach the automation program in the HVAC school plus the company provides internship opportunities to CSN students and hires graduates to work in the field of intelligent buildings. Schneider Electric also contributed $100,000 in 2019 to support the new CSN and Nevada State College Englestad Health Sciences building.
Setting up learning systems that allow students to practice on smart buildings while saving the school energy and money is a win-win.”

The project with the Henderson Health Sciences campus is funded solely by the energy savings that Schneider Electric EcoStruxure Building Operations provided through the HVAC and lighting systems: $300,000 in total annually. In addition to installing EcoStruxure, the college continued LED lamp upgrades and installed lighting controls to capture further energy savings. Schneider Electric said that the college has replaced many controls and HVAC systems with more energy-efficient equipment, including boilers, chillers, and cooling towers, which also contributed to reaching energy management goals.
The City of Sierra Vista, Arizona formed a partnership with Schneider Electric to improve life-cycle savings and revenue generation citywide. Schneider Electric plans to replace nearly 3,000 interior light fixtures in public buildings across the city with high-efficiency LEDs along with another 484 exterior LED fixtures. The company also anticipates HVAC upgrades to Sierra Vista’s aquatic center, the Cove, as well as high-efficiency replacements at City Hall and the police department. In addition, the Cove will replace an old inoperable wave machine with a new system.

Sierra Vista is paying for the upgrades through an energy performance contract with Schneider Electric that eliminates the need for outside funding. Increasing efficiencies through upgrades and generating additional revenue through sports tourism and the Cove should allow the city to redirect funding towards higher-priority areas such as economic development instead of growing utility costs, according to Schneider Electric.

The company says that the energy savings performance contract (ESPC) project delivery method helps publicly-funded entities make capital improvements over longer payback periods and offers many long-term benefits such as improved facility efficiency, occupant comfort, financial management, and environmental protection.

This project goes beyond traditional infrastructure upgrades, pairing the city’s economic development plan with Schneider Electric’s expertise to positively affect the city and its surrounding communities, the company said. The initiative supports the Sierra Vista City Council’s focus of increasing economic prosperity and demonstrating environmental leadership in the state while driving a sports tourism initiative to attract sports leagues and tournaments to the city’s unique micro-climate. Construction began in June 2019 and is anticipated to have a project life-cycle savings and revenue generation of more than $20 million annually.
The financing of the project is noteworthy in that it was paid for by projected expense reduction.”
Schneider Electric formed a partnership with the Stockton Unified School District in California to implement a new battery storage array within the school district. The battery storage should help the school district save nearly $1.6 million in energy costs over a 10-year period while optimizing the usage of the district’s existing solar assets, allowing solar energy to offset energy costs, according to Schneider Electric. The energy savings will be applied to progress other modernization efforts within the district, including replacing aging HVAC systems and additional district facility upgrades, the company said. Stockton is among the first districts in the state to deploy battery storage.

With peak rates as much as $5 per KWh compared to as little as 23 cents per KWh for non-peak rates on average, the savings from using temporary battery power can quickly add up, Schneider Electric said. After working with the company, Stockton Unified School District found that it could optimize costs by bundling their existing solar arrays at two high schools with lithium-ion batteries. Two high schools in the district received solar batteries at no cost under Prop 39 grant funding along with a $600,000 rebate that covers the full cost of the batteries.

The 250-KW and 500-KW batteries will help to offset up to 60% of the school district’s monthly bill by better harnessing and managing the renewable energy already being generated for the district, the company said. Stockton can use the money from its energy savings to redirect dollars back into the classroom, fund deferred maintenance needs, or potentially add new teaching positions, Schneider Electric noted.

Estimates in 2019 showed that only about 3% of California school districts used battery storage. However, as the costs continue to drop and peak demand rates keep climbing, more districts see potential in batteries. For example, the storage plus solar allows Stockton to avoid costly peak demand energy rates. The footprint of batteries is minimally invasive, making it easily integrated on the area campuses, Schneider Electric said.
WHAT THE JUDGES SAID...

Stockton is leading the way in energy efficiency and sustainability for California school districts.”

Solar power and grid power regenerate batteries when demand is low through a real-time system that enables batteries to intelligently discharge and recharge. Batteries can work every day to help defray energy costs. Plus the cost of batteries continues dropping, enabling the project to scale as needed, the company added.

Stockton Unified School District had already completed many initial projects aimed at optimizing energy savings and increasing sustainability, including installing onsite solar. Schneider Electric said that the addition of battery storage allowed the school district to maximize their use of onsite solar while providing additional savings opportunities.
Industrial waste management, environmental, and recycling services company Terrapure Environmental formed a partnership with battery products manufacturer and distributor East Penn Canada. Together, they sought to create a closed-loop system that could recycle as much as 99% of lead-acid batteries.

The way it works is East Penn Canada collects spent batteries from their customers and ships the batteries to Terrapure to break them down to their base components for recycling. The lead gets processed and refined to East Penn’s specifications, and is then sent back to its battery manufacturing facility in Pennsylvania. From collection to recycling to manufacturing, a recycled lead-acid battery can be back on the market in 50 to 60 days, Terrapure said. This partnership offers closed-loop circular economic value because lead can be recycled infinitely, according to the two companies.

Terrapure and East Penn Canada decided on a “tolling” agreement. Rather than leaving retailers or individuals to figure out how to recycle their spent lead-acid batteries, East Penn Canada uses a core charge to incentivize customers to return their batteries. The partners explained that, under the tolling agreement, spent lead-acid batteries go to Terrapure’s regulated facilities for smelting and refining. Terrapure uses an automated process where acid is drained, collected, and chemically treated to become sulphate. The rest enters a separation tank where lead sinks and plastic floats, and each material goes through its own recycling process. Terrapure said that the plastic is cleaned and pelletized so it can be injection-molded into new battery casings. At the end of the process, the recycled lead is molded into ingots and shipped to East Penn for the production of new batteries.

On an annual basis Terrapure receives approximately 10 million batteries and
WHAT THE JUDGES SAID...

The partnership created a closed-loop system while successfully providing energy and environmental benefits. It’s a sound model for the circular use of batteries.”

Terrapure and East Penn Canada say they are preventing waste, ensuring the beneficial reuse of a valuable commodity, and reducing demand on the lead mining industry, which helps preserve a finite natural resource.

In addition, recycling lead for battery manufacturing only takes 40% of the energy necessary to produce primary lead from ore, the partners said. The batteries contain lead and acid so managing them properly means that hazardous materials get recycled instead of entering the natural environment. }

produces 125,000 metric tons of recycled lead, recovering 99% of batteries in Canada. By using a closed-loop circular-economy approach, Terrapure and East Penn Canada say they are preventing waste, ensuring the beneficial reuse of a valuable commodity, and reducing demand on the lead mining industry, which helps preserve a finite natural resource.

In addition, recycling lead for battery manufacturing only takes 40% of the energy necessary to produce primary lead from ore, the partners said. The batteries contain lead and acid so managing them properly means that hazardous materials get recycled instead of entering the natural environment.
When Ford Motor Company began expanding their Dearborn campus to include a modern, high-tech Tier III data center, Trane Commercial undertook the project to incorporate a high-performance HVAC solution that would operate efficiently across all operational points for the desired LEED-certifiable facility. Since cooling in a data center consumes an estimated 40% of its power, Ford wanted to keep energy use and operating costs down as it outlined objectives for the 365-days-a-year, 24-hour facility, Trane said.

As the design build partner for the data center HVAC systems, Trane worked with Ford to develop solutions for the chiller plant design. Six of Trane’s 670-ton CenTraVac centrifugal chillers were installed to provide cooling for the data center. This chiller from Trane’s EcoWise portfolio was designed to use low-pressure refrigerants that operate in a vacuum, virtually eliminating leaks and enabling near-zero emissions, the manufacturer said. In addition, when outdoor temperatures are cold, the chiller design has a free cooling option to chill water, which Trans said can provide as much as 45% of chiller capacity without running the compressor.

Trane calls its CenTraVac chiller a unique part of the project for Ford. Its design allows the unit to meet the need for standard cooling or energy saving system options such as thermal storage or heat recovery. Being an EcoWise product, the chiller uses less energy to condition the space, has high reliability with fewer moving parts, and offers additional energy-saving system options, according to the manufacturer.

The project supports Ford’s climate goals to reduce global CO2 emissions and energy consumption. It also provided a safe, sustainable solution with next-generation, low global warming potential refrigerant, Trane said. The collaborative effort reduced Ford’s energy use at the new campus by 540,288 KWh per year and CO2 emissions by more than 330 metric
Superior partnership between vendor and client to help Ford meet their aggressive environmental goals.”

Dwayne Atkins, Ford’s land engineering manager, said that Trane chiller’s use of R-514A refrigerant that was the key determining factor for the chiller selection. “The refrigerant is stable, meets our greenhouse gas emissions and GWP criteria, and doesn’t pose any occupational or fire hazard risks,” he said. This project also supports Trane’s 2030 climate goals, which include reducing their customer carbon footprint by 1 gigaton, achieving carbon-neutral operations, reaching 10% absolute reduction in energy consumption, and delivering zero waste to landfills. 
Although 3D printers have been gaining popularity, they pose a human health concern from the potential release of volatile organic chemicals and ultrafine particles into the air, says the global independent safety science company Underwriters Laboratories (UL). Their Chemical Safety and Human Health division formed a partnership with Georgia Tech to perform an in-depth, two-year study to mitigate indoor air pollution risks and advance the availability of low emission 3D printers.

This research developed a methodology to identify and assess toxicity risks of the emissions released during 3D printer operation. The result: development of the first American National Standards Institute (ANSI) safety standard addressing chemical pollution and reducing its effects on human health. The Standard Method for Testing and Assessing Particle and Chemical Emissions from 3D Printers contains measurement and assessment protocols for the emissions from these machines so that comparative and consistent data can be obtained. It also assures manufacturers and users that their machine has been tested and shown to meet low-emission criteria, according to UL.

The first research phase involved defining the analytical measurement and risk evaluation methodologies for characterizing and assessing particle and chemical emissions from 3D printers. The second phase assessed potential health hazards from exposure to emissions. Chemical Safety and Human Health also held two leadership summits to discuss the research findings, and review current and future additive manufacturing techniques. Participants included printer manufacturers, material suppliers, public health professionals, academic researchers, school users, and government organizations. Following these studies, stakeholders agreed that Chemical Safety and Human Health would developing a standard for measuring and assessing printer emissions for safe use in indoor spaces.
WHAT THE JUDGES SAID...

“This successful project fills a critical gap in health and safety protocols that will be more and more important over the coming years.”

The research revealed that more than 200 different volatile organic compounds, many of which are known or suspected irritants and carcinogens, are released in 3D printer operation. The findings also showed that risks can be lessened by operating 3D printers in well-ventilated areas, setting the nozzle temperature at the lower end of the suggested temperature range for filament materials, standing away from operating machines, and using machines and filaments that have been tested and verified for low emissions.

UL said that the Standard Method for Testing and Assessing Particle and Chemical Emissions from 3D Printers supports their goal of mitigating indoor air pollution. And, as the use of 3D printers has become especially prolific in schools, this standard could help minimize children’s exposure to dangerous emissions.
As a research analyst with LNS Research, Peter Bussey primarily focuses on how digital technologies transform environment, health and safety (EHS), connected worker, integrated risk management, and sustainability performance in the industrial sector. Mr. Bussey has more than 30 years of experience in manufacturing, consulting, and technology to support EHS management, R&D, asset management, risk management, product life-cycle management (PLM), enterprise asset management (EAM), and supply chain. He has held key positions at global companies such as SAP, Alcoa, Michael Baker Corporation, Arthur D. Little, and Oracle. Mr. Bussey earned a master’s of science in environmental health from Harvard University, a master’s of public management with distinction from Carnegie Mellon University, and a BS in natural sciences with departmental honors from Johns Hopkins University.

Amy is the energy and sustainability program manager for T-Mobile, which merged with Sprint in 2020. Her expertise includes power and utilities procurement for legacy Sprint’s $260 million utility budget, building energy optimization strategies for their 12-million-square-foot portfolio, corporate goal positioning, growing green transportation access, carbon disclosure leadership, and most recently securing Sprint’s very first virtual power purchase agreements.

She is a LEED AP, has contributed to four successful LEED certifications, and in 2014 garnered the EPA WasteWise Partner of the Year for very large companies in recognition of her industry leading waste diversion program.

Amy is a graduate of the University of Kansas, with a degree in psychology and this year earned her certification for supply chain procurement, logistics, and negotiation from the university. She is also certified in CDP and GRI reporting, and is currently pursuing an MBA at Baker University. Prior to her “green” career, Amy was an award-winning weekly newspaper publisher and columnist in Washington State. She also served as a marketing professional and special events coordinator. In 2019, Amy was selected as an Environment + Energy 100 honoree.
2020 JUDGING PANEL

**KIRBY DIPERT**  
*Field Engineer, TRC Companies*

As a field engineer with TRC Companies, Kirby brings a wealth of knowledge and experience from his professional endeavors in energy efficiency, energy management, and sustainability philosophies. His work ethic and drive to consult with customers and help them solve problems is matched by his desire to educate the public about new energy efficient solutions and sustainable practices. In 2019, he became an Environment + Energy Leader 100 honoree.

Kirby holds an MBA from the Weatherhead School of Management, an MPA and a Professional Certificate in sustainable studies from Indiana University South Bend. He is also a LEED Green Associate and the board chair for the North Central Branch of the USGBC in Indiana.

**JODY EAST**  
*Plant Engineer, Wellborn Cabinet*

Jody East has a broad range of experience including military, engineering, environmental, and project management. Of his three decades in engineering, the majority include the management of environmental compliance and permitting. Project management has included everything from small process improvement projects up to 235,000 square-foot buildings, as well as large biofuels projects. As a large company’s chief plant engineer, he is also responsible for the corporate sustainability efforts including recycling, waste management, and energy management as well as corporate property loss prevention and risk management.

In his spare time he has served on several local boards and is currently serving as the chairman of the County Water Authority Board of Directors. His specialties include building energy systems, utilities/service/MCC design and management, IR Thermography-Certified Level II, Arc Flash/Short Circuit Analysis, environmental management/regulations/compliance/permitting, and CAD/CAM/CAE. Jody loves spending time with his family camping, and on good nights he’s an amateur astronomer.

**BILLY GRAYSON**  
*Executive Director, Center for Sustainability and Economic Performance, Urban Land Institute*

Billy Grayson is the executive director for the Center for Sustainability and Economic Performance at the Urban Land Institute, a nonprofit education and research organization that focuses on land use, real estate, and urban development. Mr. Grayson manages a team leading programs on climate risk and resilience, health and wellness, and building energy and environmental performance. ULI works with members, community leaders, coalition partners, and other key stakeholders to build awareness around sustainability issues in the built environment, and to provide our members with the tools and resources they need to cost-effectively drive sustainability into their projects and operations.
James Goudreau crafts strategy and policy for Novartis to increase climate resilience, reduce GHG emissions, and increase energy resilience across their global operations. These efforts include managing a diverse portfolio of efforts in technology, partnerships, renewables procurement, and climate risk assessments designed to achieve efficiency, resilience, and greater shareholder value. He is also serving on the Carbon Removals Technical Working Group for the revision of the Greenhouse Gas Protocols.

Prior to joining Novartis, he culminated a military career as a US Navy Captain working on energy and climate security issues in the Pentagon. As the Acting Deputy Assistant Secretary of the Navy (Energy) he focused on increasing operational capabilities and climate resilience globally for the US Navy and US Marine Corps.

He is a member of the Climate Security Action Group at the Center for Climate and Security at the Elliot School of International Affairs at George Washington University, and is a member of the Consensus for American Security at the American Security Project. He also works to improve sustainability and climate resilience in the Boston area as a member of the Board of Directors for the Cambridge Compact for a Sustainable Future and a member of the Board of Directors for A Better City, and was selected for the 2017 Energy Manager Today 50.

James has completed the Tuck Executive Program at the Dartmouth College Tuck School of Business and holds a bachelor of science in business administration degree from Norwich University as well as a master’s in management from Troy University. He resides in Newburyport, Massachusetts, with his wife Jennifer Goudreau, and their daughter.

Kyle Gumto is the manager of energy procurement and environmental sustainability for Cardinal Health headquartered in Dublin, Ohio. He leads the corporate energy procurement, environmental sustainability, and utility bill management programs. He provides subject matter expertise on greenhouse gas emissions, energy efficiency, environmental sustainability initiatives, external sustainability reporting, and renewable energy projects. He identifies and promotes projects with triple bottom line business perspectives with social, environmental, and financial value.

Kyle holds an MBA, a MS in environmental studies, a BS in industrial hygiene, and a BS in environmental health all from Ohio University. He is a proud Eagle Scout, an honoree of the 2018 Environmental Leader 75, and a graduate of the 2018 US DOE National Renewable Energy Laboratory (NREL) Executive Energy Leadership Program.
John Hodges is a global sustainability lead with a focus on a company’s environmental, social, and governance (ESG) programs. In his current role, he has improved energy efficiency of buildings, developed a carbon accounting program, worked towards water stewardship, and reduced diversion rates while increasing reforestation. He is tasked with creating innovative solutions through integrated reporting, the UN SDGs, global partnerships, and programs to mitigate climate change and promote social justice, including #climatejustice. John also serves as the president of the board for Sustainable Morristown, a nonprofit organization that works as the town’s “green team” towards the education and engagement of town residents.

He holds a BA in hospitality from Fairleigh Dickinson University and is working toward an MS in sustainability management from Columbia University in 2021.

Ben Larkey has been a corporate social responsibility (CSR) and sustainability professional for more than 30 years with varied organizations including government, NGO, and Fortune 500 corporations. As a CSR manager for global programs, he improved sustainability, energy, and compliance programs, and won 12 national environmental awards for companies including Canon, Verizon, and Sharp.

Ben has been recommended as an effective manager with success in varied sectors including retail with customer service, corporate responsibility, compliance, EHS and sustainability programs: business development, risk management, optimal resource use — teams, supply chain, zero waste, energy conservation and renewables, water — and continual improvement. He is proactive, and had creative success with compliance, organizational development, planning, management of complex programs, teams and facility operations as well as metrics, reporting, training, public relations and marketing, research and development, and cost reduction.

Ben has authored articles in publications as well as participated as a speaker in trade show panels, meetings, and academic sustainability programs including Rensselaer Polytechnic Institute, and Pace University Law School. He is also a musician and privileged to have been a caregiver for family members intermittently since 2007.

Ian Lifshitz is responsible for leading Asia Pulp & Paper (APP)’s sustainability and related stakeholder engagement programs across Canada, the United States, and South America. Ian is also charged with leading the company’s North American CSR activities, translating and communicating many of APP’s successful conservation, biodiversity and social community programs to North American audiences.
Mr. McEwen has over 20 years of combined professional experience in industrial hygiene, environmental health and safety (EH&S) compliance, and biological safety. He currently serves as a GEMS program manager for the Atlanta Veterans Health Care Administration. In this role, Mr. McEwen manages a 26-acre main campus and 22 community-based outpatient clinics throughout metro Atlanta.

The Green Environmental Management System (GEMS) utilizes ISO 14001 standards to manage the facilities environmental sustainability and environmental programs compliance. Mr. McEwen is the facility subject matter expert to ensure compliance with all local, state, and federal environmental laws and regulations are followed. Over the past several years, the Atlanta VAHCS GEMS program has received national recognition for winning environmental and sustainability awards from the Environmental Protection Agency. In addition, establishing industry best practices and winning numerous national environmental and sustainability awards from various organizations.

Dave Meyer is a principal consultant with BSI EHS Services and Solutions, a full service environmental, health, safety (EHS) and sustainability consulting firm. Dave’s principal focus is to help organizations achieve environmental sustainability program excellence, leverage regulatory compliance risks, and optimize organizational effectiveness. Dave has over 35 years of progressive experience in environmental sustainability, environmental performance and metrics, responsible sourcing, and green supply chain management, corporate responsibility EHS management systems planning and implementation (ISO 14001, OHSAS 18001), permitting and multi-media compliance and environmental liability auditing.

Dave’s expertise extends across many industry sectors: renewable energy, clean tech, food and beverage, semiconductor, consumer electronics, chemicals and plastics, pharma and biotech, mining, oil and gas, aerospace, forest products, transportation, public works, transportation, financial, legal, and government. Dave is presently an advisory board member for the Sustainable Business Forum and 2Degrees Network Sustainable Supply Chain Working Group.
Mary Jo Press has worked for Tesla since 2017 and has already seen significant improvements in leadership engagement in EHS. Her current focus is on standardization of policies and programs across operations. She had direct site EHS leadership of the casting operations at Tesla before moving into her global role. In her past career roles, she has a history of driving performance in large food, beverage, tobacco, packaging, and automotive industries. She volunteered as a nationally registered paramedic for many years. This role helped her to see injuries at many sites and helped her obtain a better vision of how to help someone avoid an injury and not just respond post-injury. Her passion is to responsibly pursue a safe and sustainable community in the Native American tradition of not depleting the earth and spirit of our global community.

Mary Jo has a desire to see others learn and grow. She has taught in the community college system as an adjunct professor in industrial and environmental management, served on professional national leadership committees and mentored other safety professionals through the American Society of Safety Professionals. Mary Jo is a sustainability management certified professional (SMCP), a certified fire protection specialist (CFPS), and global safety professional (GSP). She serves as secretary of the board of directors for the Sustainability Management Association. Mary Jo holds a bachelor’s degree in chemistry from North Carolina State University and an MS degree in occupational safety and health from Columbia Southern University, where she graduated with honors and induction into Sigma Alpha Pi Honor Society – National Society of Leadership and Success.

Travis Solberg has led sustainability for Solberg Manufacturing in Itasca, Illinois, since January 2009. Solberg Manufacturing is a two-time Illinois Governor’s Sustainability award and Real Leaders Impact Awards winner. They have won a number of other environmental awards, including B Corporation Best for the Environment. Travis is a 2019 Environment + Energy Leader 100 honoree. He is determined to continuously make the world a better place through his family business and their network of professionals in a variety of environmental and community interests.
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