Industry Advisory Board (IAB) Commercial Product Report

U.S.-CHINA CLEAN ENERGY RESEARCH CENTER

BUILDING ENERGY EFFICIENCY (CERC-BEE)

MARCH 2020

Lawrence Berkeley National Laboratory (LBNL) leads the U.S. CERC-BEE and is located at:

1 Cyclotron Road Mail Stop 90R4000 | Berkeley CA | 94720

Contact Information

Carolyn Szum
Lawrence Berkeley National Laboratory
1-510-486-4106（work）
ccszum@lbl.gov

Jing Hou
Lawrence Berkeley National Laboratory
JHou@lbl.gov

Deke Dun
Lawrence Berkeley National Laboratory
1-202-812-0502（work）
DekeDun@lbl.gov

Contents

I. Integrated Design, Construction, and Industrialized Building

DOW
Product Table

Name	Description	URL	Contact
DOWSIL™ Silicone Air Barrier System	Uncontrolled air leakage can result in increased energy use and costs. DOWSIL™ Silicone Air Barrier System is specifically designed to ensure the airtightness of the building envelope. • The air infiltration rates of DOWSIL™ Defend Air 200 beat current industry standards, helping keep energy costs down. • By securely adhering to challenging flashing materials and construction substrates, DOWSIL™ 758 Silicone Weather Barrier Sealant ensures continuous sealing without additional penetrations from mechanical fasteners.	https://www.dow.com/documents/en-us/app-tech-guide/63/63-61/63-6163-01-air-barrier-system-overview.pdf?iframe=true	
Cool Relfective Roof Coating TECHLINE 11	Elastomeric Reflective Maintenance Coatings increase the longevity and energy savings of bitumen roofing.	http://msdssearch.dow.com/PublishedLiteratureDOWCOM/dh_09ae/0901b803809ae2fd.pdf?filepath=dcc/pdfs/noreg/840-02301.pdf&fromPage=GetDoc	
DOW CORNING® 3-0117 SILICONE INSULATING GLASS SEALANT	Dow Corning® 3-0117 Silicone Insulating Glass Sealant is a single-component silicone elastomer intended for use as a secondary sealant in a dual-sealed insulating glass unit, and can be used in a unit that is structurally glazed. Dow Corning® 3-0117 cures in the presence of atmospheric moisture to produce a durable, high-modulus, flexible silicone seal that is chemically stable and shows little change in physical properties with weathering.	https://www.dow.com/en-us/pdp.dowsil-3-0117-silicone-insulating-glass-sealant.02328551z.html	

Website
http://www.dow.com/en-US/search#t=Products

DUPONT

Product Table

Name	Description	URL	Contact
LIQUIDARMOR™	LIQUIDARMOR™ Flashing and Sealant is an innovative liquid flashing alternative to conventional tape. It is designed to provide commercial buildings advanced moisture and air sealing protection. The elastomeric spray forms a tight, durable, seamless barrier along the rough openings of windows and doors while helping to significantly reduce labor time during installation. A winner of the 2016 Edison "Gold" Award for Energy and Sustainability, LiquidArmor™ Flashing and Sealant delivers high-performance protection from moisture and air for commercial buildings.	https://www.dupont.com/products/liquidarmor-flashing-and-sealant.html	

Website
https://www.dupont.com/

II. Integrated Sensors, Controls, and Commissioning

Johnson Controls (JCI)
Product Table

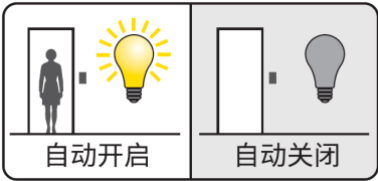| Name	Description	URL	Contact
Central Plant Optimization	The next generation of Central Plant Optimization (CPO) software developed by Johnson Controls uses predictive algorithms to minimize cost, not just energy. This proven, patented technology uses up-to-the-minute data and looks out over a time horizon to help operators optimize cooling, heating and power generation in a holistic way. The approach helps make both plant design and operating decisions to minimize lifecycle costs and greenhouse gas emissions while delivering reliable utility services. The CPO solution monitors all kinds of inputs, including data gathered from your connected equipment and systems to external information like weather forecasts, utility rates, and maintenance schedules. Using these inputs, updated every 15 minutes, our algorithms automatically generate optimization decisions and implement them so you can minimize utility costs and maximize available utility incentives. Much of a plant's future operating costs are locked in when making initial plant design decisions. The cloud-based CPO Planning Tool creates a virtual representation of your central plant and simulates plant utility costs for each hour of the year. It allows you to perform "what-if" scenarios, evaluate plant designs and upgrades, and compare actual performance with the original predictions. Plus, it interfaces seamlessly with the CPO Operational Tool to ease the process of installing and maintaining the CPO system over time.	https://www.johnsoncontrols.com/digital-solutions/central-plant-optimization	Michelle Bai +86 21 2285 7621 Michelle.Bai @jci.com
Enterprise Management	Building owners and managers can optimize building performance by monitoring equipment, managing energy consumption, and efficiently utilizing available space. The platform offers applications that provide you with actions and insights that identify issues and faults, pinpoint inefficiencies, and give tenants control of comfort and convenience features. Not only will it help you reach energy and sustainability goals, it will help you exceed one of your most important goals – occupant satisfaction. **Power to Manage and Visualize** Monitor and manage data, equipment, and systems from a single pane of glass. **Power to Optimize and Save**	https://www.johnsoncontrols.com/digital-solutions/johnson-controls-enterprise-management	Michelle Bai +86 21 2285 7621 Michelle.Bai @jci.com

	Uncover ways to optimize energy efficiency and equipment uptime. Easily use KPIs to measure what is important to your organization. **Power to Analyze and Act** Data and insights significantly enhance your ability to harness the power of AI and machine learning to forecast.		
Metasys^{tm} Building Automation System	Metasys makes your building smarter and more efficient. It connects your HVAC, lighting, security and fire protection systems, and gets them all "talking" to each other in a common language, on a single platform to give you information you need to make better decisions, save money and improve the way your building functions. **INFORMATION** As it controls equipment, Metasys also collects critical data, which it turns into powerful information you can use to make decisions about your energy and operations strategies. **VISUALIZATION** The user interface presents information in a simple, intuitive way to help you quickly identify potential problems. So trouble-shooting is simpler, and order is restored in less time. **OPTIMIZATION** Even more information is available through powerful energy analytics to analyze Metasys data stored on premise or in the cloud. This information is also accessible anywhere, on virtually any device.	https://www.johnsoncontrols.com/building-automation-and-controls/building-management/building-automation-systems-bas	Michelle Bai +86 21 2285 7621 Michelle.Bai @jci.com

Website
https://www.johnsoncontrols.com/
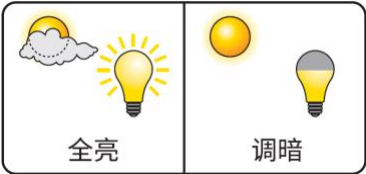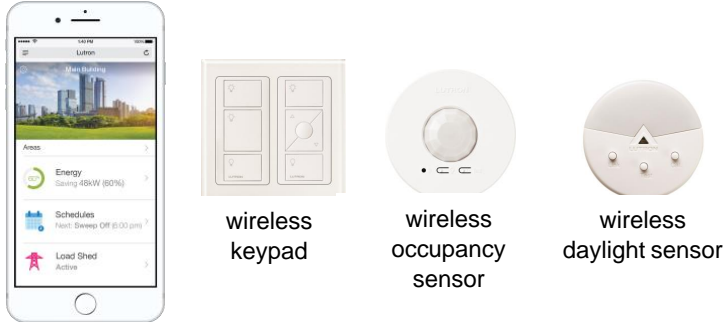
LUTRON

Product Table

Name	Description	URL	Contact
Radio Powr Savr™ wireless occupancy sensor	自动开启　自动关闭 Lutron Radio Powr Savr™ wireless occupancy/vacancy sensors are engineered to maximize energy savings and	http://www.lutron.com/en-US/Products/Pages/Sensors/Occupancy-Vacancy/WirelessRadioPowrS	Greg Chan ggchen@lutron.com +86-185-2178-5913

	ease installation. It saves energy by directing compatible wireless controls to turn lights/ plug loads off based on room occupancy. Going wireless eliminates the need for costly new wiring and each sensor can be installed in as little as 15 minutes. • Saves installation cost and time • Utilizes Lutron reliable Clear Connect™ RF Technology to ensure consistent performance • Lutron XCT signal processing technology enhances the performance for detecting fine motions • Vacancy modes for maximum energy saving with manual on and auto off operation • Front accessible buttons make set up easy • 10-year battery life • Available in ceiling-mount, wall mount, corner-mount and hallway options	avr/Overview.aspx	
Radio Powr Savr™ wireless daylight sensor	全亮　调暗 This battery-powered, ceiling-mount wireless daylight sensor saves energy by dimming or turning off electric lighting when sufficient daylight is available. The sensor detects light in the space and then wirelessly transmits the appropriate commands to the compatible dimming and switching modules via Lutron Clear™ Connect Radio Frequency (RF) technology. • Features Lutron reliable proportional daylight open loop control • Designed to give a linear response to changes in viewed light level • Has a light range of 0-100,000 lux and a photopic response that matches human eyes • One sensor is capable of switching and continuous dimming of multiple zones per changes in daylight level • Simple calibration with front accessible test buttons for easy setup • 10-year battery life	http://www.lutron.com/en-US/Products/Pages/Sensors/RadioPowrSavrDaylightSensor/Overview.aspx	Greg Chan ggchen@lutron.com +86-185-2178-5913

Pico® wireless switches/ keypads	Pico® wireless switches/keypads can adjust lights, shades from anywhere in a space. This versatile and easy-to-use controller requires no wires and is compatible with a wide variety of Lutron lighting control and automated window treatment solutions. • Utilizes Lutron reliable Clear Connect™ RF technology with a range of 9m through wall • Available as a wall-mount, table‑top or handheld control • Offers single or dual gang faceplates in different finishes including glass, metal and plastic • Easy to relocate and add a new or additional point of control without running conduit or cable • 10-year battery life	http://www.lutron.com/en-US/Products/Pages/Components/PicoWirelessController/Overview.aspx	Greg Chan ggchen@lutron.com +86-185-2178-5913
Vive™ wireless lighting control	wireless keypad wireless occupancy sensor wireless daylight sensor Vive™ is a revolutionary, modular wireless lighting control solution for new and existing commercial buildings. The Vive wireless hub provides centralized control and integration for all wireless devices such as keypads/switches, occupancy and daylight sensors with lighting control modules. Use Vive software on any smart phone to wirelessly connect system controls and program system settings, including energy reporting, schedules and load shed. • A simple and scalable solution for every space and budget • Meet latest green building standards • Easy to set up without engineers from manufacturers	http://www.lutron.com/en-US/Products/Pages/WholeBuildingSystems/Vive/Overview.aspx	Greg Chan ggchen@lutron.com +86-185-2178-5913

	• RF signal strength detection technology automatically finds nearby devices making job setup faster • Seamless integration with building management systems through BACnet		
Quantum® total light and energy management system	 Quantum® is a Lutron sys management by tying the most complete line of lighting controls, automated window shades, digital LED drivers, and sensors together under one software. It provides facility managers and owners the ability to collect and manage data that optimize the environment for occupants and improve building operations and energy efficiency. • Ideal for new construction or retrofit applications and scalable from a single area to an entire building, or to a campus with multiple buildings • Manage, monitor and report on all the lighting energy usage in a building • Multi-control strategies to manage all the light in your building with intuitive graphical user interface (GUI) • Seamless integration with building management systems through BACnet • Advanced capabilities, such as tunable white control and solar-responsive shading software, ensure a responsive system able to provide the right environment throughout the day	http://www.lutron.com/en-US/Products/Pages/WholeBuildingSystems/Quantum/Overview.aspx	Greg Chan ggchen@lutron.com +86-185-2178-5913
Hyperion™ solar-adaptive shading system	 Wireless window sensor	http://www.lutron.com/asia/Products/Pages/ShadingSystems/Hyperion/Overview.aspx	Greg Chan ggchen@lutron.com +86-185-2178-5913

	Hyperion™ solar-adaptive shading system automatically adjusts Lutron Sivoia QS shades throughout the day in response to the changing position of the sun, saving energy, and reducing glare and heat gain. To allow direct sunlight to penetrate deeper into the workspace, customized shade schedules are developed by combining information about building location and façade orientation. • Automatic shade adjustment using advanced solar tracking technology, with or without sensors • Maximize occupant comfort, natural daylight, available views, and energy savings • Adding Window sensors to adjust shades based on both the sun's position and changing exterior weather conditions on that façade to maximize performance and minimize unexpected shade movements • Flexible manual control of shades possible at any time to override Hyperion control to suit personal preference		

Website
http://www.lutron.com

UTC
Product Table

Name	Description	URL	Contact
WEBCTRL® SYSTEM	A proven, industry-leading system, the WebCTRL® building automation system gives you the ability to fully understand your operations and analyze the results with tools that make sense to you.	http://www.automatedlogic.com/pages/product-webctrl.aspx	
ECO-SCREEN® SUSTAINABILITY KIOSK	Automated Logic's Eco-Screen® Sustainability Kiosk is a powerful tool that allows building owners to showcase their facilities' energy conservation and sustainability measures.	http://www.automatedlogic.com/pages/product-ecoscreen.aspx	
ENERGYREPORTS™	With the new EnergyReports Editions, building owners and operators will be able to use their WebCTRL building automation system to securely push data from a single building or a portfolio of buildings to the cloud. From there, they can create graphs, charts, reports and	http://www.automatedlogic.com/pages/Product-ER-S.aspx	

	dashboards to visualize the building data, which will enable them to: - Convert energy consumption data to cost or carbon dioxide emissions - Benchmark building performance data against ENERGY STAR® scores - Analyze and normalize energy consumption across buildings - Identify performance issues to maximize building efficiency - Improve occupant comfort, productivity and engagement - Compare energy costs across buildings - Drive energy conservation measures		

Website

http://www.utc.com/Who-We-Are/Pages/Products-And-Brands.aspx

III. Direct Current (DC) Buildings and Smart Grid

LumenCache
Product Table

Name	Description	URL	Contact
LumenCache DC lighting system	The LumenCache platform replaces traditional 110V AC power distribution in buildings with a new standard more appropriate to the low power needs and digital capabilities of electronic devices including LED lights. LumenCache connects the grid edge (devices inside your power meter) to the installed devices that consume the energy using proven structured wiring techniques.	http://lumencache.lighting/why-lumencache/	

Website
http://lumencache.lighting/why-lumencache/

NEXTEK
Product Table

Name	Description	URL	Contact
PHD: Power Hub Driver	The Power hub Driver is the next generation of Nextek's flagship product. It provides 16 fully controllable channels that provide up to 1600 watts of low voltage power output. Due to ever changing Building and Energy Codes, power and lighting systems are undergoing an industry wide transformation that requires components to be interactive, responsive, efficient, reliable and in a word, SMART! The Power hub Driver provides the ideal platform to support this evolution of smart power technologies. From the fully integrated multiple	https://www.nextekpower.com/new-page-18	

	communication options, to the significant array of built-in safety and performance features, the PhD can support a wide assortment of highly efficient DC powered fixtures and loads within buildings of today and tomorrow. The PhD also offers the unparalleled opportunity to provide full integration with a variety of renewable power sources. In short, the PhD is 'Really Smart Power'.		
SKY Controls	Nextek Power Systems offers complete control of your building lighting through the SKY-Controls system of sensors, devices and cloud-based software. The SKY system consists of a family of control devices that communicate with each other in a wireless mesh network to provide a new standard of control and energy monitoring. This translates into the most cost-effective energy saving technology available. The highly programmable and interactive control architecture allows you to make the most efficient and responsive changes to your environment. The SKY-Controls system helps you realize significant savings for your facilities.	https://www.nextekpower.com/sky-controls	
FANWORKS	Nextek Fanworks DC Ceiling Fan products and accessories are the perfect solution for improving the airflow in indoor areas where AC power is not available. Our DC ceiling fans are a perfect fit for your home, office, cabin, gazebo, greenhouse, school, warehouse, or any location where AC power is not readily available. Solar panels and speed controls are also available for maximum energy efficiency.	https://www.nextekpower.com/fanworks-catalog	
Power Server Modules	The Power Server Module is Nextek's flagship product. It features 16 fully controllable channels that provide up to 1600 Watts of low voltage power output. Nextek's Power Server Module converts 120, 208, 240, 277 VAC, or 380 VDC power to 24 VDC through 16 individual Class 2 outputs. The Power Server Module has a wireless remote control and monitoring system. The system advantage of the Power Server Module is a safe, low-voltage DC distribution system that supports quick plug-and-play, energy efficient and individually controllable Direct Current (DC) lighting and other loads. Nextek's Power Server Module accepts power inputs from both DC and AC sources, to ensure your systems are never without power. When the DC resource is no longer available, the PSM automatically converts AC power to DC.	https://www.nextekpower.com/new-page	

Website

https://www.nextekpower.com/about-us/

Wattstopper
Product Table

WattStopper®

Name	Description	URL	Contact
Wireless Network Bridge	The LMBC-600 Wireless Network Bridge provides a network connection for a room with Wattstopper Digital Lighting Management (DLM) devices. The wireless DLM platform simplifies room to room connectivity and installation, and eliminates potential start-up delays caused by wiring issues.	https://www.legrand.us/wattstopper/digital-lighting-management/network-components/lmbc-600.aspx	
ON/OFF/0-10V Dimming Room Controllers	LMRC-110 series room controllers include one or two relay(s) to switch a total of 10 amps, a high-efficiency switching power supply and dual 0-10 volt outputs per relay for control of dimmable loads including compatible LED drivers or electronic ballasts. They are the foundation of a Digital Lighting Management (DLM) system, and allow integration of occupancy sensors, daylighting controls and switches for energy-efficient control.	https://www.legrand.us/wattstopper/digital-lighting-management/load-controllers/lmrc-11x.aspx	
Architectural diming platform	The architectural dimming panel platform products include the Lighting Control and Automation Panel (LCAP) series, and a range of unique user interfaces. The platform seamlessly integrates with the award-winning Digital Lighting Management (DLM) system to deliver optimal energy performance and integration with A/V, shades, climate, and other systems.	https://www.legrand.us/lighting-controls-building-systems/architectural-dimming.aspx	
Fixture Sensors & Controls	We've engineered our fixture integrated (FS) and our high bay (HB) sensors for optimal performance. So even in the most challenging applications, such as wet and outdoor environments, effective lighting control provides energy savings you can count on.	https://www.legrand.us/lighting-controls-building-systems/fixture-sensors-controls.aspx	
Network Segment Manager (Segman)/ Network supervisor	The LMSM Segment Manager is a network controller designed to communicate with DLM local networks and/or LMCP panels. It provides control, monitoring, adjustment, and standard or Human Centric Lighting (HCL) scheduling functionality for networked DLM systems. The Network Supervisor is a PC server running similar software designed to coordinate control of multiple Segment Managers and store historical data.	https://www.legrand.us/wattstopper/digital-lighting-management/network-components/lmsm-segment-manager.aspx	

Website

https://www.legrand.us/wattstopper.aspx

IV. HVAC Energy Savings for Indoor Air Quality

eLichens
Product Table

E L I C H E N S

Name	Description	URL	Contact
Indoor Air Quality Station	eLichens' sensors are integrated into an Indoor Air Quality Station which is compact, low power and cost optimized to offer relevant measurement of indoor air pollutants such as CO2, VOC, PM2.5, PM10 and also temperature, pressure, humidity and noise. The station is connected to a cloud for the data to be cloud calibrated and treated. Thanks to eLichens' platform, it is also possible to have access to outdoor air quality data and obtain a complete study of the air you breathe outside and inside. Depending on the application, the station can be customized to fit the need of our customers.	https://www.elichens.com/smart-home	Marc Attia, +1 415-573-7595, marc.attia@elichens.com
ULTRA-LOW-POWER CO2 SENSOR	Possessing cutting-edge NDIR (Nondispersive Infrared) patented technology including patented IR source, patented optical design and advanced signal processing algorithms, eLichens CO2 sensor is the smallest, ultra-low-power consumption CO2 module in the world. The low-power is a key differentiator permitting innovative applications based on energy harvesting or battery-powered products. Its mechanical architecture can be customized to meet better integration into final products. Key features include: • Measurement range: 0-10,000 ppm • Small and compact design for an easier integration • Ultra-low-power consumption • Very low peak current • Simple digital communication UART interface • High accuracy with NO drift over time • Factory calibrated with temperature compensation • Fast response time	https://www.elichens.com/hvac-dcv	Marc Attia, +1 415-573-7595, marc.attia@elichens.com

Website
www.eLichens.com

Saint-Gobain

Product Table

Name	Description	URL	Contact
Saint-Gobain PAM Elixair© system	Elixair© system, a shallow geothermal fresh air system. Fresh air is absorbed into a specially designed ductile iron pipeline through the air inlet and then thermal exchanged with the underground shallow soil. The fresh air is introduced into the indoor room through the air outlet, and then connect with fresh air handling unit by air duct. Saint-Gobain PAM can provide total solution which include Elixair© system, fresh air handling unit, air quality monitoring system depends on the customer requirement. Advantages of Elixair© system: • Utilization of renewable geothermal resources in shallow soil layer. • Ductile iron pipe with excellent thermal conductivity, anti-corrosion performance, hygiene performance. • Pre-heating and pre-cooling of fresh air, energy saving. Advantages of PAM Elixair© pipe: • Special joint design ensures water tightness and air tightness. • Long service life protected by excellent external coating and internal lining. • Special system design to clean the pipe inside condensation water.	https://www.saint-gobain.com.cn/en/node/2605	Hudson Li (+86 18116375115) Hudson.li@saint-gobain.com Zhang Xuan *(+86 18116375327)* xuan.zhang @saint-gobain.com

Website
https://www.saint-gobain.com.cn/en/pam

V. Systems, Economic Analysis, and Modeling

USGBC
Product Table

Name	Description	URL	Contact
LEED Green Building Rating System	LEED is an internationally recognized mark of excellence for buildings, communities, and professionals that are transforming the built environment. LEED is an ideal tool to measure, evaluate and compare the performance of the CERC BEE Demonstration Building. By using LEED and its Arc performance platform, we can have confidence that the performance of the building is verified by a credible third-party review process.	https://new.usgbc.org/cert-guide	Mark Ginsberg mginsberg@usgbc.org Brown 13774406625 cxu@usgbc.org
LEED Zero	For more than two decades, LEED has provided a framework for high performance buildings and spaces, and reduced greenhouse gas emissions through strategies impacting land, energy, transportation, water, waste and materials. Building on that work, the U.S. Green Building Council has developed LEED Zero, a complement to LEED that verifies the achievement of net zero goals and signals market leadership in the built environment. • **LEED Zero Carbon** recognizes buildings or spaces operating with net zero carbon emissions from energy consumption and occupant transportation to carbon emissions avoided or offset over a period of 12 months. • **LEED Zero resources** ○ **Energy** recognizes buildings or spaces that achieve a source energy use balance of zero over a period of 12 months. ○ **Water** recognizes buildings that achieve a potable water use balance of zero over a period of 12 months. ○ **Waste** recognizes buildings that achieve GBCI's TRUE Zero Waste certification at the Platinum level. LEED Zero represents a new level of achievement in green building that is not just attainable but is the goal of LEED certified projects around the world.	https://www.usgbc.org/programs/leed-zero	Mark Ginsberg mginsberg@usgbc.org Brown 13774406625 cxu@usgbc.org

Website
www.usgbc.org