BPA E3T IT TAG Emerging Technologies and Strategies

ID#	Title	Short Description
1	Efficient Power Supplies for Electronic Devices	Power supplies for computers and consumer electronics with greater (over 80%) efficiency.
5	Running Data Centers at Higher Voltages for Energy Savings	Running IT equipment in data centers on 400/230 volts AC, as is common practice outside of North America, will reduce resistance and conversion losses.
16	Underfloor Air Distribution	A method of air distribution in commercial buildings that uses the open space (underfloor plenum) between the structural concrete slab and the underside of a raised access floor system to deliver conditioned air directly into the occupied zone of the building.
41	Optimized Controls for Expected Loads	Optimize controls to ensure systems are efficient at all loading conditions, including peak load, rather than just sizing for peak load.
52	Reuse of Heat from Server	Recover the heat normally exhausted from server rooms to provide heating in other areas of the building.
55	Set HVAC Equipment Tightness Requirements	Use the ASHRAE Standard 193 method of test to determine the air-tightness of HVAC equipment "box types" that should be referenced in equipment specifications, energy programs and codes.
62	Air Flow Management in High-Density Data Centers	A technique and technologies that prevent chilled supply air from mixing with surrounding warmer air before it reaches the servers. This air flow separation avoids the energy waste that occurs from having to supply larger volumes of chilled air to achieve the necessary cooling.
68	Direct Server Cabinet Cooling	A special cabinet that encases servers so only the servers are cooled, not the entire server room.
98	OLEDs for Display Applications.	Organic light-emitting diodes (OLEDs) for applications such as computer monitors; televisions; and screens for tablets, laptops, and handheld electronic devices.
105	Premium HVAC Equipment	Using the most efficient HVAC equipment available has great energy saving potential.
119	Air-Side Economizer for Data Centers	Using 100% outside air cooling capability in a data center to provide free cooling in an application where outside air would otherwise be provided only to satisfy minimum ventilation requirements.
121	Ultra-Sonic Humidification for Commercial Buildings	Ultrasonic humidifiers add moisture to the air without heating the water, by injecting ultrasonic pulses into the water, vibrating water molecules at high speeds. This overcomes molecular forces and allows microscopic water molecules to escape.
148	Energy Efficient Office Equipment	Encompasses a multitude of equipment and electronics and myriad opportunities to save energy and adopt new technologies.
158	In-Rack Data Center Cooling	A dedicated single-rack cooling system using an integral water-cooled air handler at the base of each server rack.
159	Solid State Drives (Flash Memory)	Using solid state drives (SSD), or flash drives, for data storage/memory can provide better performance and use less energy than traditional disk hard drives in computers.
164	Server Virtualization	Consolidating the data from a number of partially loaded servers into a single server to cut power use and heat production.
169	ENERGY STAR Standby in Electronics	The drive to reduce energy consumption of electronics in the ENERGY STAR® program while in stand-by mode.
179	Advanced Metering Infrastructure	Digital metering that gathers energy usage data, including electic and gas as well as water, and transmits the data to a third party who manages the data on behalf of utilities.
189	Energy-Efficient Computer Power Supplies and Adapters	Power supplies and adapters running at efficiencies greater than the industry average of 75%.
230	Encourage Replacement of In-Service Standard Efficiency Motors with Premium Efficiency Models	Encourage replacement of in-service industrial motors with NEMA Premium®- or Enhanced-efficiency motors that are 2% to 9% more efficient than standard motors.

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235	Educating Installers in New Technologies and Relevant Incentives	Educating installers and industry professionals about new technologies and increasing their awareness of incentives may result in more projects and products being implemented.
252	High-Performance Indirect Evaporative Cooler	Employs Regenerative Indirect-Evaporative Air Cooling (REAC) with heat recovery. Uses exhausted indoor air to preheat (or precool) make up air via heat exchanger.
254	Partial OSA Economizer for Loop-Type Systems	Using an economizer system to provide "free" cooling in appropriate situations even with a loop-type situation that could potentially recover heat from one zone and move it to another.
258	Low Temperature Air for Airside Economizer	Buildings with cooling loads throughout the cold winter months, such as data centers, elevator equipment rooms, and copy rooms, can benefit from free cooling via an airside economizer that is allowed to operate at lower than 55 degrees.
272	Dashboard Systems and Continuous Monitoring-Based Commissioning	Monitoring-based commissioning (MBCx) utilizes monitoring of remote metering to continuously commission building systems to identify previously unrecognized system inefficiencies.
348	Training on Energy-Efficient Product Selection	Training for designers and procurement officers on the wise selection of products that affect energy use.
350	Increased Use of Key Performance Indicators in HVAC System Optimization	Energy management control systems can use key performance indicators to quickly identify problems or inefficiencies in an HVAC system and send alarms to personnel to alert them of the problems.
356	Integrated and Turnkey Energy Management and Control Solutions	Fully integrated equipment and controls that make it easy for property managers to optimize energy use.
365	Energy Use Benchmarking Tool Using Utility Meter Data	Reports for building managers that summarize their building energy use (based on utility meter) and compares it to other buildings of a similar type.
382	Modular HVAC Equipment for Data Centers	Recommended to help match changing heating and cooling loads at data centers by providing more smaller units to allow for a more linear match of equipment capacity to computer room load. Further, it offers indirect evaporative coolers for air side economizers.
445	Thermoelectric Refrigeration for Cabinet Cooling	An air conditioner used to cool electronic equipment that works by sending current through two dissimilar conductors and offers superior efficiency over conventional refrigeration systems.
452	Liquid Submersion Cooling for Data Centers	A method of cooling data center servers by submerging them in dielectric oil, resulting in reduced energy use, peak demand, and infrastructure requirements compared with air cooling or liquid pipe-to-point cooling.
473	Wireless Sensor Network for Data Centers	A network of sensors in a data center to provide real-time, floor-to-ceiling information on humidity, air pressure, and temperature conditions.
485	Modular Data Centers	A self-contained portable data center unit that can be configured to be used to replace, expand, or modify existing data centers, or used instead of a conventional data center.
486	Ongoing Commissioning of Economizers in a Data Center	A program to verify performance and make corrections to the air side economizers in a data center.
487	Heat Recovery in a Data Center	Use of refrigeration or hydronic loops to capture waste heat from data center and transfer heat to adjacent spaces needing heat.
488	High-Efficiency UPS Equipment for a Data Center	Installing new, more efficient UPS units as a direct replacement to reduce losses and save energy.
489	Training of Best Practices and Tools for Data Center Designers	Training and Raising Awareness in the Latest Energy Management Best Practices and Tools for Data Center Designers.
490	Cloud Computing	Utilizing cloud services for computer processing and storage needs for appropriate applications.

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491	Replace UPS with On-Board Battery Backup on IT Equipment	Using on-board redundant battery backup for servers rather than using uninterruptable power supplies.
492	Modular UPS Equipment in a Data Center	Installing multiple modular UPS units in a manual or automated variable module management system (VMMS) in place of a single unit to increase part-load efficiency.
494	Transformerless UPS Equipment	Choosing transformerless UPS units as direct replacement to reduce transformer losses and save energy.
495	Utilize Waste Heat to Warm Generator Blocks in a Data Center	Install waste heat recovery and/or controls to reduce generator block heating loads.
496	Right-Size Data Center Power Equipment	Avoiding over-sizing power equipment to reduce power conversion losses.
497	Automate Data Retention and Deletion Policies	Utilizing software programs to identify data that is redundant or unnecessary.
498	Relocate Transformers to Outside of Conditioned Space in a Data Center	Relocation of active transformers to reduce demand on the cooling system in conditioned spaces.
499	Personnel and Cable Grounding to Allow Lower Humidity in a Data Center	Personnel and cable grounding to guard against damage to the equipment due to electrostatic discharge (ESD), allowing lower IT equipment intake humidity in a data center.
500	Bypass or Eliminate UPS Input Filters	Eliminating input filters equipment to reduce filtering energy losses.
501	Specify Computing Performance Metrics for New IT Equipment	High performance and high efficiency specifications to ensure purchasing of efficient equipment.
502	Use Supplemental Cooling for Occasional Loads in a Data Center	Employing supplemental equipment for occasional supplemental cooling to avoid over-sizing primary equipment for transient peak loads.
503	Supply DC Power to IT Rack in a Data Center	Supplying DC voltage to IT racks to consolidate voltage conversions, saving distribution losses.
504	Data Center Infrastructure Management	Software and a network of sensors to get a real-time visual display of thermal conditions in a data center to allow finer control.
505	Optimizing Data Center Controls	Software and a network of sensors to get a real-time visual display of thermal conditions in a data center along with controls that can adjust cooling and other equipment to minimize energy use.
506	Make IT Managers Financially Accountable for Data Center Energy Use	Any number of strategies to reward data center managers for achieving energy and financial savings in operating the data center efficiently.
507	Improved Data Storage Management	Various data storage strategies, including smaller hard drives, solid state drives, and "thin provisioning" (TP).
508	Power Management for IT Equipment	Taking advantage of power management capabilities in servers and other IT equipment to be able to shut them down or lower the power consumption when not in use.
509	Storage Area Network and Network Core Consolidation	Reduction in number and size of distributed rack based switching hardware and services into smaller, higher bandwidth core machines with associated consolidated cabling systems.