Why Maricopa Needs a Ban on Data-AI-Quantum Centers and BESS Projects:

Truth be Told

Chapter Two

by: Brad Follett
Earth Month Network, Inc.

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CHAPTER TWO Quantum Centers and BESS Projects

WITH the advancement of Data and Artificial Intelligence, Quantum Physics is being researched and *applied to AI* so that AI can be rendered to work faster and more efficiently with improved quantitative and qualitive outcomes, in areas that could not be reached with AI alone.

The Applications are being made towards formable continued research, development and to commercialize quantum information science to advance national security, economic competitiveness, and scientific leadership.

These are embodied onto four core functions and goals:

- **Quantum Innovation:** Build scalable quantum computers, ultra-sensitive sensors, and robust quantum communication networks.
- **Ecosystem Building:** Unite national laboratories, universities, and private industry partners into collaborative research hubs.
- **Workforce Development:** Train the next generation of scientists and engineers through hands-on academic and professional programs.
- **Technology Transfer:** Move foundational basic science findings quickly into private-sector commercial applications

The Quantum National Initiative has developed the Co-design Center for Quantum Advantage termed CQ2A focus built upon fiver pillars of advanced science and research, udder the U.S. Department of Energy Office of Science in collaboration with five premier QUI research facilities.

Battery Energy Storage Systems (BESS) technology projects and their usage is being applied to Data-AI-Quantum centers that can supplement energy to a center that has been stored from the grid, solar and wind energy with the capacity to return energy to the grid. They are also utilized for direct energy storage to supplement the grid.

Quantum Centers and Battery Energy Storage System (BESS) projects and facilities are intrinsically different from that of Data and AI centers to the extent of the totality of what they are, history, how they are utilized with data and AI centers, who is utilizing them currently, future use and applications, energy-water-environmental nexus and security interests.

It brings about a colossal number of issues to bring to the fore to be considered and evaluated in making an informed decision for implementation of a ban. In doing so facts will be presented as to what is involved with this complicated process so that the current distorted views are brought back in alignment with new optics.

DEFINING QUANTUM CENTERS

Previously, the so-called data/AI centers were defined in detail in the former paper which was received with this chapter by the Mayor and Council for the City of Maricopa and planning and zoning. This document as noted in the executive summary is included herein and attached hereto by reference and made a part hereof. [1]

It is important to identify what separates ***Data, AI and Quantum centers*** from one another. Data centers, AI centers, and Quantum centers represent successive technological evolving stages in digital infrastructure since the 1940s.

Standard data centers store and route general information using traditional servers. These are the ones that handle the Cloud, websites, company and government information, social media accounts etc. AI centers are specialized facilities optimized with massive GPU clusters to train machine learning models. In many cases these are human trained which results in massive errors and misinformation. Quantum centers are emerging facilities housing sensitive quantum processors that leverage physics for complex calculations. [2]

Core Purpose and Function

- **Data Centers:** Store, manage, process, and distribute standard enterprise data, web traffic, and cloud applications using classical binary logic (0s and 1s).
- **AI Centers:** Train and run deep learning networks, large language models, and pattern-recognition software via parallel processing.
- **Quantum Centers:** Solve hyper-complex optimization, molecular simulation, and cryptographic tasks using qubits capable of superposition. [1, 2, 3, 4, 5]

Hardware and Architecture

- **Data Centers:** Built with standard x86 CPU servers, high-capacity storage arrays, and robust fiber-optic network switches.
- **AI Centers:** Dominated by thousands of clustered Graphics Processing Units (GPUs) and Tensor Processing Units (TPUs) engineered for matrix math.
- **Quantum Centers:** Built around Quantum Processing Units (QPUs) requiring dilution refrigerators and extreme environmental controls.

Environmental and Facility Needs

- **Data Centers:** Require standard raised-floor cooling, redundant commercial grid power, and fire suppression. [1, 2, 3]

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[1] Follett, Why Maricopa Needs a Ban on Data Center Projects: Truth be Told, August 29, 2026.

[2] Joe Gose, Naritt, Real estate Working for You, *Quantum Computing Emerging as Next Demand Layer for Data Centers,* February 27, 2026.

- **AI Centers:** Demand massive, multi-megawatt to gigawatt power footprints and aggressive liquid or high-capacity air cooling for high-density chips. [1, 2, 3]
- **Quantum Centers:** Require near-absolute-zero cryogenic cooling environments and heavy physical isolation to block out external vibrations and electromagnetic noise. Quantum centers have advanced functions to support industries racing to adopt quantum computing include:
- **Financial services:** Firms are exploring quantum algorithms for real-time portfolio optimization, Monte Carlo simulations, and risk management.
- **Pharmaceutical R&D:** Drug discovery processes stand to benefit from quantum simulations of molecular structures and chemical reactions.
- **Logistics and manufacturing:** Supply chain optimization, materials science, and manufacturing design are natural fits for quantum optimization algorithms.

Quantum centers are emerging as the next computing revolution, [3] some say to take over AI. This may be a misnomer and only meaning their importance over that of AI and will rely primarily on data centers not that of AI and extend to High Performance Computing (HPC).

Quantum computers require **regular (classical) data infrastructure much more than AI** to function. A Quantum Processing Unit (QPU) cannot operate on its own; it relies entirely on a heavy backbone of regular classical computers, control electronics, and cryogenic systems to translate code, prep inputs, and fix errors in real time. [1, 2, 3]

Why Regular Data Infrastructure is Essential

- **Control and Readout:** Classical computers run the pulse generators and microwave controls that manipulate qubits. [1, 2, 3]
- **Data Prep and Post-Processing:** Regular servers must handle all data before it goes into the QPU and process the raw answers that come out. [1]
- **Physical Environment:** Quantum hardware relies on heavy classical engineering, including dilution refrigerators to reach absolute zero, vacuum chambers, and vibration isolation. [1, 2, 3]

Where AI Fits In

- **Co-processing and Optimization:** AI (running on regular GPUs) and quantum computers work as a team. Quantum accelerators handle specific high-dimensional math or molecular simulations, while AI manages the broader workflow.
- **Hardware Calibration:** Advanced AI models are used to calibrate fragile quantum chips and decode error correction streams on the fly.

Where are these Quantum centers? The United States has five primary National Quantum Information Science Research Centers established by the U.S. Department of Energy (DOE) in

[3] Datacenters.com Technology, Quantum Computing: The Next Data Center Revolution? September 22, 2025.

2020. These major hubs coordinate research across national laboratories, universities, and private industries with five laboratories.[4]

The Five DOE Quantum Centers

- **Co-design Center for Quantum Advantage (C2QA):** Led by Brookhaven National Laboratory.
- **Q-NEXT:** Led by Argonne National Laboratory.
- **Quantum Science Center (QSC):** Led by Oak Ridge National Laboratory.
- **Quantum Systems Accelerator (QSA):** Led by Lawrence Berkeley National Laboratory.
- **Superconducting Quantum Materials and Systems Center (SQMS):** Led by Fermi National Accelerator Laboratory.

The rapid growth of this technology is expanding exponentially as Google has been in the private sector game since 2020 and is about ready to proceed with implementation. It has its drawbacks with energy demand over that of AI where specialized cooling requirements are needed with cryogenic liquid nitrogen (LN_2), and special shock and vibration proof buildings. Researchers suggest that such a center would eventually be scaled inside a data center within one of the data halls. Research moves forward to integration. [5]

Cryostat Chamber - Google Quantum AI Lab, facility in Santa Barbara, California

Google's Quantum AI campus in Santa Barbara, California, features a state-of-the-art quantum data center, research labs, and processor fabrication facilities. The interior houses large, barrel-sized cylindrical dilution refrigerators (cryostats) that resemble metallic, hanging chandeliers surrounded by intricate webs of black control wiring. [1, 2, 3]

Key Facility Areas

- **Cryostat Chambers:** Room-sized apparatuses holding bronze and metal plates that cool quantum chips down to 10 milliKelvin—colder than deep space.
- **Control Hardware:** Racks of precise electronic instruments and wiring matrices used to manipulate individual qubits.
- **Cleanrooms & Fabrication:** Specialized workspaces where engineers build and test custom superconducting microprocessors like Willow. [1, 2, 3, 4, 5]

[4] "National Quantum Information Science Research Centers" Fermilab for the U.S. Department of Energy, Office of Science, https://nqisrc.org/

[5] Google Quantum AI, https://quantumai.google/lab

There are now major tech corporations and specialized private-to-public firms operate advanced private quantum research labs ready to move in. Key players include IBM, Microsoft, Quantinuum, PsiQuantum, and Amazon Web Services (AWS). [1, 2, 3, 4, 5]

Major Corporate Tech Labs

- **IBM Research:** Operates massive superconducting hardware facilities and the Qiskit developer ecosystem.
- **Microsoft Quantum:** Focuses heavily on topological qubit development and hybrid infrastructure.
- **Amazon Quantum Solutions Lab:** Provides collaborative research and cloud brokering via Amazon Braket.
- **Intel Labs:** *Researches* silicon spin qubits leveraging traditional semiconductor manufacturing lines. [1, 2, 3, 4, 5, 6]

Dedicated Quantum Firms and Startups

- **Quantinuum:** Formed via Honeywell Quantum Solutions, building trapped-ion hardware and security software.
- **PsiQuantum:** Developing a utility-scale, error-corrected photonic quantum computer using silicon photonics.
- **IonQ & Rigetti:** Pioneer trapped-ion and superconducting architectures with dedicated private fabrication and testing facilities. [1, 2, 3, 4, 5]

With so many in the industrial technology Quantum segment moving forward it will not be much longer before it becomes fully implemented. Some may have heard of it but had no idea of what it is and thus are not ready and are ill-prepared.

CENTER CONSIDERATIONS

While examining the newer technology of Quantum centers as compared and related to Data and AI centers the design, engineering, components, construction, commissioning operation and maintenance are quite different. Twenty percent or more of components come from China. With this comes the subjects of ***Energy, Water and Environmental Nexus.***

ENERGY

Comparative for their size and utilization of GPUs and other integrated IT systems, Quantum centers are again resource sponges. Running these systems requires them to interface primarily with Data centers first then AI and run continuously at high output necessitating equal amounts of energy for a *large facility*. A reduction in energy demand is offset with less use of water for cooling systems and ambient air, so chillers units are reduced. In its pace in the utilization of cryogenics as liquid nitrogen (N_2) and liquid helium (^3He or ^4He).

A single quantum computer processor uses roughly **25 kilowatts (kW)** of power, which is comparable to just a **single server rack** in an AI data center. For specific heavy computational tasks, a quantum system can be thousands of times more efficient than classical supercomputers or massive AI clusters. [1, 2, 3, 4, 5]

Energy Use: Core Comparison

- **AI Data Center:** Consumes anywhere from **20 megawatts (MW) to over 100 MW** (with some hyperscale campuses exceeding 650 MW). A single high-density AI rack packed with specialized GPUs draws **50 kW to over 100 kW**. [1, 2, 3, 4]
- **Quantum Computer:** The core processor unit typically draws between **2.6 kW and 25 kW** depending on whether it uses neutral-atom or superconducting architecture. [1, 2]

Infrastructure and Cooling Differences

- **AI Centers:** Massive power usage goes directly into raw compute loads and intense cooling infrastructure (air or liquid cooling) needed to manage dense racks running at maximum capacity 24/7. [1, 2, 3, 4, 5]
- **Quantum Centers:** While the processor itself sips power, superconducting quantum systems require complex cryogenic dilution refrigerators to maintain near-absolute-zero temperatures. These cooling systems add a continuous power overhead of about **5 kW to 10 kW per fridge**, plus control and error-correction electronics. [1, 2]

Efficiency per Computation

- Quantum computers do not replace general cloud hosting, but for targeted optimization, simulation, and complex math problems, they can solve in minutes what takes classical or AI hardware thousands of hours. [1, 2, 3, 4]
- On a per-task basis for supported algorithms, quantum efficiency can be orders of magnitude higher, effectively reducing the equivalent multi-megawatt operational footprint of a massive AI workload down to a single-digit kilowatt footprint. [1, 2, 3]

Once again this would depend on how many Cryostat Chambers and Core Processing units are utilized in equal unit comparison CPUs and other IT systems of Data and AI centers.

WATER

A quantum data center's direct water use for core cooling is expected to be lower, often a fractional compared to a massive, water-evaporative AI or traditional data center. And newer package systems. However, quantum systems swap water for extreme cryogenics, relying instead on liquid helium and liquid nitrogen. [1, 2, 3, 5]

Direct Cooling vs. Cryogenics

- AI/Data Centers: Consume millions of gallons of water daily through cooling towers and evaporative systems to manage heat from massive server racks. [1, 2]
- Quantum Centers: Superconducting quantum computers require ultra-cold dilution refrigerators operating near absolute zero rather than standard water-based HVAC cooling loops. On-site water consumption drops heavily, though rare elements like helium-3 become the logistical constraint. [1, 2, 3]

Indirect Water Footprint

- Power Generation: Most of a data center's total water footprint is indirect, the water consumed by off-site power plants to generate electricity. [1]
- The Comparison: While early research suggests quantum processors could eventually run certain complex optimization tasks with significantly less total energy than classical or AI supercomputers, scaling a hybrid quantum accelerated infrastructure still draws substantial grid power. If that electricity relies on conventional thermoelectric power plants, the indirect water usage remains tied to regional grid efficiency. [1, 2, 3, 4, 5]

ENVIRONMENT

Quantum centers are still required to perform due diligence in all aspects of environmental performance compliance requires fulfilling strict performance standards across power efficiency, water usage, carbon tracking, and waste management to meet ESAs and beyond for regulatory and green building benchmarks which do not differentiate from Data and AI Centers. [1, 2]

Key Environmental Performance Areas

Energy and Power Efficiency

- **Power Usage Effectiveness (PUE):** Achieve low design and operational PUE ratios, targeting close to 1.15 or lower for modern facilities.
- **Renewable Energy Procurement:** Secure Power Purchase Agreements (PPAs) for 100% wind, solar, or zero-carbon energy matching consumption.
- **Grid Impact and Peak Load:** Demonstrate grid stabilization support, battery storage integration, and minimal peak-load disruption. [1, 2, 3, 4, 5]

Water Conservation

- **Water Usage Effectiveness (WUE):** Optimize liters of water used per kilowatt-hour, aiming for ultra-low or zero water consumption cooling designs. [1, 2, 3, 4]
- **Water Source Audits:** Avoid using potable municipal water in water-stressed regions; use recycled greywater or closed-loop systems instead. [1, 2]
- **Discharge Compliance:** Test and monitor wastewater quality to ensure safe thermal and chemical levels before local release. [1]

Emissions and Climate Tracking

- **Scope 1, 2, and 3 Emissions:** Quantify direct diesel generator emissions, indirect grid electricity emissions, and embodied carbon in building materials. [1]
- **Backup Generator Limits:** Restrict annual testing hours and install Tier 4 final or cleaner selective catalytic reduction filters on diesel backups. [1]
- **Refrigerant Management:** Track and eliminate high Global Warming Potential (GWP) leaks from cooling loops using low-GWP alternatives.

Waste and Circular Economy

- **E-Waste Recycling:** Partner with certified recyclers (such as R2 or e-Stewards) to process old servers and lithium batteries responsibly.
- **Construction Waste Diversion:** Divert a high percentage of demolition and building materials away from local landfills during setup.
- **Hazardous Materials Control:** Manage safe containment and disposal protocols for lead-acid batteries, coolants, and fire suppressants. [1, 2, 3, 4]

Site Ecology and Land Use

- **Biodiversity Impact:** Avoid building on protected wetlands, critical habitats, or prime farmlands.
- **Noise Pollution Abatement:** Meet local decibel thresholds for cooling fans and backup generators running at full load.
- **Light Pollution Control:** Use dark-sky compliant outdoor lighting to protect nocturnal wildlife patterns. [1, 2, 3]

DEFINING BATTERY ENERGY STORAGE SYSTEMS

A Battery Energy Storage System (BESS) is an electrochemical device that collects and stores energy from the grid or a power plant, and then discharges that energy at a later time to provide electricity or other grid services when needed. BESS is a fast-growing market. The installed capacity reached approximately 1.4 GW by the end of 2020, which is a growth of 7X over 5 years, and exceeded 2.5 GW by 2023 with approximately 3.5GW currently.

Primary drivers for BESS market growth include

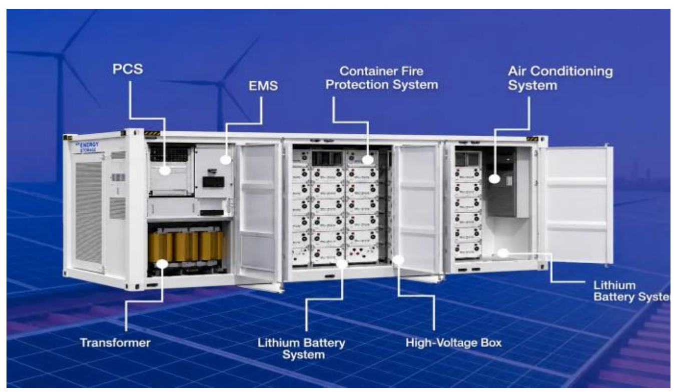
- The increase in need for system flexibility due to Wind and Solar projects deployment, along with rapid decrease in the cost of battery technology.
- The continuous innovation in BESS and policies to ramp up BESS deployment.
- Battery energy storage is one of several technology options that can enhance power system flexibility and enable high levels of renewable energy integration.

Rechargeable battery technology has existed for over 160 years, starting in 1859 by French physicist Gaston Planté inventing the first rechargeable lead-acid battery, making energy storage and reuse physically possible for the first time. However, modern large-scale Battery Energy Storage Systems (BESS) built for power grids and commercial use are quite new, with the first major utility-scale demonstration projects launching around 2012. [6]

Over the past fourteen years these systems have advanced in technology from containers to components, cooling systems and fire protection, etc. Containers to house BESS began with utilizing 6 -10-foot x 8 x 8.5 intermodal units/shipping containers. At present, containers can be larger and come from the offshore supplier or from the onshore supplier sized and fitted to meet specified needs, e.g. internal engineering configurations, battery storage, cooling demands and fire safety. Containers from ***offshore source acquisition suppliers*** may also contain and meet the needs as above.

BATTERIES AND COMPONENTS

Inside a Battery Energy Storage System (BESS) container, you may find modular lithium-ion battery racks, a battery management system (BMS), a power conversion system (PCS/inverter), thermal management units like HVAC or liquid cooling, an active fire detection and suppression system, and an overarching energy management system (EMS). [1, 2, 3]



Kunetic container BESS with six subsystems.

Core Internal Subsystems

- **Battery Racks and Modules:** Stacks of lithium iron phosphate (LFP) or nickel manganese cobalt (NMC) cells wired in series and parallel to store massive amounts of direct current (DC) electricity. [1, 2, 3, 4, 5]
- **Battery Management System (BMS):** An internal smart network that watches over individual cell voltages, temperatures, and states of charge to keep operations safe and balanced. [1, 2]
- **Power Conversion System (PCS):** Bi-directional inverters that convert DC power from the batteries into alternating current (AC) for grid use, and vice versa during charging cycles. [1, 2]

[6] Battery University, *BU-1501 Battery History,* https://www.batteryuniversity.com/article/bu-1501-battery-history/

- **Thermal Management System (TMS):** HVAC units, air ducts, or liquid cooling plates that maintain strict internal ambient temperatures to maximize battery life and prevent overheating. [1]
- **Fire Suppression System:** Integrated aerosol, gas, or water-mist detectors and suppression mechanisms zoned at the cabinet or module level to isolate thermal runaway events. [1]
- **Energy Management System (EMS):** The master software controller that automates dispatch schedules, grid commands, and monitors overall system health. [1, 2]

BESS DRAWBACKS

ENERGY

During 1893 -1896 there was an electrical battle between Eddison's direct current (DC) and Tesla's alternating current (AC) known as the "War of the Currents." Tesla's AC eventually won out. [7] The major problem with this is that our homes and commercial electronics, centers and BESS require DC power, and are unable to receive it from the grid, it must be converted from AC to DC. In all systems there is a power loss, in BESS systems it can be a 20% to 25% loss, depending on the system.

Energy loss from the utility grid through a Battery Energy Storage System (BESS) to a data center typically results in an AC-to-AC round-trip efficiency of 80% to 90%, meaning a total energy loss of 10% to 20% per full charge and discharge cycle. [1, 2] Not sustainable energy.

Where Energy is Lost in the BESS Cycle

- Power Conversion System (PCS): Converting incoming AC power from the grid into DC power for storage, and then back to AC (or DC) for the data center, introduces switching and semiconductor losses of about 2% to 4% per conversion stage. [1, 2, 3, 4, 5]
- Transformers and Cabling: Step-up and step-down medium-voltage transformers, switchgear, and physical cabling generate ohmic (resistance) losses that account for 1% to 2% of the energy. [1, 2, 3]
- Battery Cell Electrochemistry: Internal electrical resistance during the flow of ions and incomplete chemical reversibility during charge/discharge cycles result in DC-to-DC internal resistance heat losses of 3% to 7%. [1]
- Thermal Management and Auxiliaries: Heating, ventilation, and air conditioning (HVAC) systems, liquid cooling pumps, battery management systems (BMS), and continuous standby controls draw parasitic loads that consume another 1% to 3% over time. [1, 2]

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[7] Energy.gov, The War of the Currents: AC vs. DC Power, https://www.energy.gov/articles/war-currents-ac-vs-dc-power, November 18, 2014.

Operational Factors Affecting Loss

- C-Rate and Load Profiles: Rapid power swings and high-frequency charging or discharging (common in supporting volatile AI workloads) increase ohmic heating and drop inverter efficiency. [1, 2, 3, 4]
- Ambient Temperature: Operating in extreme heat forces HVAC and cooling systems to work harder, raising auxiliary power consumption and accelerating battery degradation. [1]

FIRE SAFETY

Battery Energy Storage Systems (BESS) carry a higher inherent fire and thermal runaway risk per unit of stored energy than standard data center infrastructure, primarily due to dense lithium-ion chemistry. However, direct numerical comparisons of "how much more prone" are rare because data centers and BESS serve different functions, and BESS units are increasingly integrated *inside* or adjacent to data centers for backup power. [1, 2, 3, 4, 5]

Risk Factors: BESS vs. Data Centers

- **BESS Units:** Utilize tightly packed electrochemical cells. When a failure occurs, it can trigger **thermal runaway**—an un-stoppable self-heating chemical reaction that is difficult to extinguish and prone to reigniting. [1, 2, 3]
- **Data Centers:** Face electrical and fire hazards from high-voltage transformers, UPS systems, and dense server racks running hot AI workloads, but they do not inherently contain massive concentrated blocks of chemical storage fuel unless a BESS or large UPS battery array is present. [1, 2, 3]

Safety Trends and Incident Rates

- **Improving BESS Safety:** Data from the Electric Power Research Institute (EPRI) BESS Failure Incident Database indicates that the actual failure and fire incident rate per megawatt-hour (MWh) deployed dropped significantly (by roughly 98% to 99%) over the last several years as the industry shifted to safer chemistries like Lithium Iron Phosphate (LFP) and improved operational oversight. [1, 2, 3]
- **Community and Insurance Perceptions:** According to risk assessments (such as reports highlighted by AM Best), insurers view the combination of high-density power demands, heavy cooling loads, and on-site energy storage batteries as an escalating risk profile that requires specialized fire mitigation engineering rather than standard commercial templates. [1, 2]

Fire suppression units for Battery Energy Storage Systems (BESS) require a multi-layered approach because lithium-ion batteries can undergo thermal runaway and self-reignite. Effective setups combine early off-gas/smoke detection with clean agents, condensed aerosols, or water deluge systems designed to cool and control propagation. [1, 2, 3, 4, 5, 6, 7, 8]

Core Detection Methods

- **Off-Gas Detectors:** Sense toxic or flammable venting gases (hydrogen, carbon monoxide) *before* visible smoke or fire occurs.
- **Double-Knock Smoke/Heat Sensors:** Use dual-verifying optical or thermal detectors to minimize false alarms and trigger shutdowns.
- **BMS Integration:** Links the Battery Management System directly to the suppression control panel to isolate faulty electrical racks. [1, 2, 3, 4, 5]

Suppression Agent Options

- **Condensed Aerosol Systems:** Release finely divided potassium compound powders (such as Stat-X Fire Suppression) that stay suspended longer to stop reignition. [1]
- **Clean Agents & Inert Gases:** Non-conductive gases like Novec 1230, FM-200, nitrogen, or argon suppress active flames quickly without water residue, though they may require prolonged retention to prevent thermal runaway rebound. [1, 2, 3]
- **Water Sprinkler / Deluge Systems:** Provide essential cooling capacity to lower cell temperatures and prevent cascading structural failures, often featuring external fire department quick-connections. [1, 2]

Design Standards & Strategies

- **NFPA 855 & UL 9540A:** Compliance standards governing safe installation spacing, deflagration venting, and fire propagation testing.
- **Controlled Burnout / Containment:** For remote outdoor layouts, engineering designs often prioritize structural firewalls and container separation distances to let a compromised module burn defensively while protecting adjacent units. [1, 2]

New technology brings forward engineered fire insolation built into the containers as fires spread very quickly excelling uncontrolled explosions. These prevent internal proliferation as well as spreading to other proximity containers. [8]

The outcome of BESS fires from Lithium Iron Phosphate (LFP), Nickel Manganese Cobalt (NMC), Flow Batteries (e.g., Vanadium), Lead-Acid, and Sodium-Sulfur (NaS) batteries, is that of escaping contaminants and pollutants into the air can cause human and environmental harm.

Human Health Hazards

- **Toxic Gas Inhalation:** Combustion and off-gassing create dangerous plumes containing hydrogen fluoride, carbon monoxide, hydrogen cyanide, and sulfur dioxide. [1, 2, 3]
- **Heavy Metal Exposure:** Airborne soot can transport fine particulate matter laced with nickel, cobalt, manganese, and lithium, causing acute symptoms like throat irritation, headaches, coughing, and a metallic taste. [1, 2]

[8] Promat by etex, Maximize battery storage & safety with our BESS fire protection solutions.

- **First Responder Risks:** Long-burning, volatile fires require specialized defensive postures and continuous air monitoring, as units can unexpectedly reignite hours or days later. [1, 2]

Environmental Impact

- **Water Runoff Contamination:** Massive volumes of firefighting water mix with acids, organic solvents, and heavy metal fragments, creating hazardous chemical runoffs that can breach local drainage systems. [1, 2]
- **Soil and Wetland Deposition:** Heavy metal fallout deposits directly onto nearby topsoil and aquatic environments, where persistent elements like nickel and cobalt can integrate into local food webs. [1]
- **Prolonged Site Remediation:** Debris management and the neutralization of thousands of damaged, high-voltage battery modules require complex hazardous material handling that can last for months or years. [1, 2

QUANTUM - BESS SECURITY INTERESTS

Quantum centers contain approximately 20%≥ of their components, i.e., hardware, software, optics, or raw critical minerals which are sourced and acquired from China. Estimate indicators bring forward that China supplies up to 90% of global BESS cell components and around 63.5% to 70% of finished non-EV lithium-ion battery and other batteries with components imported into the United States, as well as other components and materials as copper.

The concern is great just as it is with Data and AI centers. The United States does not have facilities to manufacture components for Data, AI, Quantum centers and BESS, they must be sourced and acquired from other countries, primarily China.

Did you know that it is not lawful to utilize components from countries of concern, e.g. China (including Hong Kong and Macau), Russia, Iran, North Korea, Venezuela, and Cuba of which to design, engineer, build, commission, operate and maintain projects and centers?

The formable base laws related to this prohibits such projects as centers in the USA that acquire parts or components from such ***countries of concern*** must comply with the John S. McCain National Defense Authorization Act (NDAA) for 2019 [9] and 2026 [10] and the Department of Justice Data Security Rule through Executive Order 14117[11] that restricts transactions involving "bulk sensitive personal data" by countries of concern, and that are implemented by the Bureau of Industry and Security. [12]

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9 John S. McCain NDAA for FY 2019, National Defense Authorization Act Section 889.

10 Cyber and Artificial Intelligence Provisions in the FY2026 National Defense Authorization Act (NDAA) P.L. 119-60.

11 Executive Order 14114, February 24, 2024, *Preventing Access to Americans' Bulk Sensitive Personal Data and United States Government-Related Data by Countries of Concern.*

12 Bureau of Industry Security, *Industry Guidance to Prevent Diversion of Advanced Computing Integrated Circuits,* May 13, 2025

Added to this is the influx of Chinese involvement with "port mining" of severs inside Data and AI centers. The administration in D.C. has pending paperwork with the FCC to ban US imports of new Chinese optical transceivers—critical data center hardware used to transmit high-speed data for artificial intelligence infrastructure—citing national security risks and potential espionage concerns. [13]

BESS projects and facilities have two distinctly separate core functions in providing energy. First, they provide energy to drive and support Data, AI and Quantum centers. Second, they provide energy back to the grid, directly to another non data industry, or to the public.

When we apply the national security litmus test to BESS, they would be tagged as unlawful when utilized for supplying energy to a Data, AI or Quantum center, and must be carefully analyzed for other uses. Case in point, if a BESS built without an extended end user, and then an end user in the future is determined to be a center containing components from a country of concern, then those BESS units would then be deemed unlawful use. This gives credence to the need to know who the applicants, principals and occupants of a center and BESS facility project are beforehand as part of due diligence.

SOLUTION

As the city of Maricopa may continue to advance projects in the face of federal law and regulations without any real and proper guardrails in place to protect the citizens, the environment, agriculture and property, what is to be done? First would be to heed to law and regulations by banning. Second, the city still needs proper guardrails established by zoning and planning, and compliance with all of the preliminary focused environmental prerequires. Develop specific ordinances and codes for these projects as they are actually termed Extreme High Industrial (EHI), as zoning and planning and have already been notified.

In determining if a moratorium or ban on centers is needed, we have answered that question fully. The additional question is, which is it to be as each have different optional approaches when implemented.

A moratorium is a temporary pause used to study impacts and update regulations which can be repealed, while a ban is a more permanent prohibition on new construction, and may apply to current construction for cause.

1. Moratorium

A moratorium "presses pause" on accepting new applications or issuing building permits for a set period. [1, 2]

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[13] John Hendel, E & E News, *Trump's China crackdown could target AI data center gear,* August 5, 2026.

- **Purpose:** It gives local or state governments time to evaluate how massive data centers impact local resources (like power grids and water supplies) and to draft updated zoning or environmental regulations. [1, 2]
- **Duration:** Strictly time-limited, typically ranging from a few months to a year ≥ . [1, 2]
- **Example:** New York Governor Kathy Hochul signed an executive order imposing a one-year pause on the construction of large hyperscale data centers (50+ megawatts) to study their environmental and energy impacts.

2. Ban

A ban is a complete halt on data center development within a specific jurisdiction. [1]

- **Purpose:** It is generally enacted when a community or local government determines that data centers are fundamentally incompatible with their long-term goals, zoning laws, or environmental standards. [1]
- **Duration:** Permanent or indefinite until the law is specifically repealed.
- **Example:** The town of Warrenton, Virginia, enacted a permanent ban on new data center developments to protect residential and historic zones from further technological sprawl. [1]

The current situation in proper light of Federal Law and Regulations ***requires a ban over that of a moratorium.*** [*supra* at page 12 and 13] These laws and regulations are a formidable basis. Added to this is that the administration in DC has on it table with Federal Communications Commission (FCC) are drafting a proposed rule to ban U.S. imports of new models of Chinese optical transceivers—critical hardware components that let data move at high speeds over fiber-optic cables inside artificial intelligence data centers. [14] This goes along with what is already in place. They have not address port mining yet.

To better reason on this, consider this scenario. We have many laws in the USA and Arizona that have repercussions if violated. The three that unfortunately run together are drugs, weapons and human trafficking. They are so horrendous in our society it has been determined by citizens and governments that there is no room for them, and laws were made and continually to be changed to reflect such opposition and penalties.

What if instead of laws being enacted, citizens and their governments decided to just put a pause or a moratorium upon such wrongdoing, instead of enacting laws as a ***ban*** and enforcing them? It would be so much worse than it is today as one can only imagine the decay.

For the most part, components for center projects are not manufactured in the United States or its territories. They must be sourced and acquired from countries of concern and those components are designed, engineered, constructed, and built into a project and then commissioned and then refitted when worn which is a violation of law, regulations and the policies of the United States in protecting national and our state security. This is the primary consideration

[14] Capitol Brief, *US weights import ban for Chinese component used in AI datacentres*, August 4, 2026.

over that of energy, water and the total environmental issues whereby a moratorium would not and will not suffice to the law and policy. It then becomes incumbent upon the city of Maricopa to comply as a *matter of law and ethics*.

In the end no matter of which is implemented, or not, the city must develop specific Programs, Plans, Polices, Procedures Ordinances and Codes of which to regulate corporations in the acquisition of land for the development of any such center project, and its design, engineering, construction, commissioning, operation, and decommissioning to protect human life, energy, water, and the environment, et. al. A large administrative damage and entanglement is that of NDAs' which undermines transparency and fairness to the citizens.

If you have fast paced to the end at this point, then you have missed the venerable attributes of the subject matter. On the other hand, after reading and studying the evidence-based information and reference materials a well-informed decision can be made and applied forthwith.

It is our earth, our planet, Maricopa as one's home, it is the only one we have. As simple humans we were entrusted to care for this creation in its entirety, that means not just the total environment and delicate ecosystems, but one another. Such as water is a human right to all, so is the right to a quality of life that cannot be surpassed or taken away by actions of oligarchy or a corporation, which are destroying our earth. It becomes a matter of whose side you want to be on?

About the Author

Brad Follett is the Founder of Earth Month and currently the President of the Earth Month Network, Inc a 501(C)3 valued as a seasoned professional within a large scope of environmental genres and human rights on a global basis.

Follett transcended from environmental activities as a youth through college with first degree as an Environmental Systems Engineer, the US Air Force in Civil Engineering, and Professor of Practice with the USAF Academy teaching specialized water treatment technologies.

One technology Follett engineered is High Purity Filtration of wastewater for direct reuse in potable systems, that was later transferred to the Air Force Research at Wright Patterson AFB Ohio and is becoming a common treatment methodology in use today as Ultra Filtration.

Follett is a champion for Participative Management Practices and is somewhat reserved from accepting honors instead assigning distinctions to others for their fine work, e.g. former President Jimmy and First Lady Rosalynn Carter with the prestigious Lifetime Achievement Award, and locally Hon. Kris Mayes, Arizona Atty General, Environmental Excellence Award, etc.

However, Follett accepted recognition from the Elizabth Haub School of Law at Pace University, in Environmental Law and Policy, for his work, as it promoted advancement of issues affecting Education and FAA NexGen flight paths in Arizona and other states, Plastic Pollution and the prohibition of the Keystone XL Pipeline for the State Department.

With a strong concern with education Follett authored the paper entitled "*Arizona Education on the Environment K-12 Initiative*" in 2016 designed to remove Common Core Education.

Follett's current research is being conducted on the direct correlation with *Global Warming and Climate Change* and the causative effect upon regions on the earth with weather, water security, bee populations, crops and animal husbandry.

As for *centers*, while in the USAF Follett compile research only available at a center at Ft. Mead MD, and since has been in other government and civilian facilities some in Arizona: four by Motorola, then General Instruments in Chandler, Iron Mountain, Meta, Google, then at CyrusOne as an LSP and has personally witnessed the changes and growth and their reasons for populous expansion.

The weighty theme for Earth Month this year is "Water Security Now and For Our Future" because there is no doubt, ***"Water is a human right."***

On a personal note, Follett, in his love for life and others enjoys great food and sharing it, so he became a good chef, bon appetite.

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