

# Efficiency/Sustainability Matrix

Metric	Traditional Data Center	 ServerDome	ServerDome Sustainability Advantage
Power Utilization Effectiveness (PUE)	1.58 (1.20 - 2.00)	1.13 - 1.17 Annualized	Requires nearly 30% less power, significantly reducing carbon footprint on an annual basis; designed for alternate energy sources when available
Water Utilization Effectiveness (WUE average)	1.8 L/kWh	0.1 L/kWh	Significantly lower demand on precious municipal water supplies; designed to accommodate waterless immersion cooling when appropriate
Building materials	Traditional building materials use very little recycled products	Made of 60% recycled aluminum / low CO2 emitting concrete, made of non-combustible materials	Better use of resources means lower environmental impact; significant reduction of fire hazard
Mechanical Systems	Requires raised floor, air plenums, air conditioners, heaters, ductwork, supply fans, humidifiers, dehumidifiers and plumbing	By eliminating CRAC's, chillers, pumps and plumbing, the mechanical infrastructure is limited to supply fans and evaporative cooling devices	Reduced infrastructure components translates to reduced energy consumption and lower carbon footprint
Electrical Systems	Inefficient Transformers; power robbing electrical harmonics; inefficient fluorescent lighting;	High efficiency harmonic mitigation transformers; motion activated LED lighting; 415/240 volt power = up to 5% reduction in energy consumption	Improved use of power, reduces PUE, as well as minimizing required gear which reduces carbon footprint
Lifespan	Lack of flexibility and agility to re-configure facilities and implement emerging technologies reduces useful lifespan	Designed specifically for scalability, flexibility, and agility to provide future-proofing	A longer lifespan equates to highest efficiency and utilization of resources and an overall reduction of carbon footprint
Building Afterlife	Makes use of non recyclable materials (sheet rock etc.)	Made of mostly recyclable materials	ServerDome materials can be largely recycled, lowering pressure on landfills and reducing demand on rare earth elements
Building Repurposing	Difficult and expensive to remodel or repurpose buildings due to embedded infrastructure	Specifically designed for transformation to adopt emerging technology, the structure can be easily repurposed for a variety of uses	Eliminates disposal / recycling of materials and prolongs life of initial building materials through re-provisioning
Site Footprint	A typical 4 MW data center will require 1.5 - 3 acres of property	High efficiency integrated design means a typical 4MW ServerDome needs less than 1 acre of land	Less land requirement equates to more efficient land management
Green Space	Typically green space is an after thought, and requires more land	Green space is built into the design and is part of the site plan	Assists cooling of structure; increases amount of Carbon processed into O2
UPS	Uses environmentally unfriendly lead-acid batteries; 3-5 year replacement & disposal cycle	Uses state-of-the-art kinetic flywheel technology for carry through time; low maintenance, 20 year lifespan	Reduced footprint; lowers environmental impact on local landfills; reduced need for rare earth elements
Environmental Discharge	No feasible uses of discharges or effluents	Heat recycled for data center when needed; heat-exchanged easily to heat nearby buildings or greenhouses	Makes better use of waste stream, and lowering energy needs of nearby buildings
Architecture	Not designed to be efficient from an architectural, perspective; building shape does not contribute to energy efficiency	Geodesic dome creates more usable space with less materials than any other design	The building shape allows hot air to rise to a central point, reducing cooling fan power