



GREEN STORAGE TWG

2023 Review and 2024 Plans

Presented by:

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Green Storage TWG 2023 Accomplishments

[Green Storage TWG Charter link](#)

- Recent completed work – summary:
 - Supported 2022 EPA DCS Unit Shipment Report Submissions; 2023 in progress
 - Collaboration with TGG on EU Lot9 Regulatory updates
 - Supported Lot9 Titanium power supply extension
 - Ongoing Industry Support for V4.0 Emerald Measurement Specification test tools & kits
 - Engaged w/ the EPA regarding revised/future test methodologies
 - Worked towards a revised test methodology for block level Storage Systems (Emerald 5.0)
 - Developed a new test methodology for Storage Devices
 - Working to release Emerald Device Level Spec (Preliminary draft in review)



Green Storage TWG ROADMAP- 2024

Approximate and subject to change

Update 12-13-23

#

Events

CY2024														CY 2025				CY2026
														Q1	Q2	Q3	Q4	
1	SNIA-GTWG F2F Invite EPA to concall	▽	SNIA Member Symposium Jan '24						▽	vF2			▽	vF2	▽	SNIA Member Symposium Jan '25		
2	EPA-SNIA Industry Meetings	▽	EPA Meeting for updates							...as needed...			▽	DCS Stakeholder Meeting				
3	ENERGY STAR Data Analysis (on file submittals)								▽	V2.0/2.1 data analysis								
4	ISO version of Emerald 4.0 (tentative)									Submit to ISO		▽		▽	Publish ISO standard			
5	Emerald Measurement Spec v5.0 CTS lite replacement for Vdbench Update to Spec Storage 2020	▽	Define scope Draft Spec for internal review			▽	Spec V5.0 (internal draft)		▽	Spec V5.0 Public review		▽	Submit for SNIA Approval					
6	Storage Device Level Power Efficiency Measurement (SDLPEM) On going data collection	▽	(SDLPEM)	▽	Public review	▽	Submit for SNIA Approval		▽	Publication								
7	Futures																	
	Memory attached persistent storage		Investigate and make recommendations															
	Test methodologies for capacity optimization, data protection, etc. (impact on performance, energy consumption)																	
	Energy measurement for large / new distributed systems; consider small scale measurement as system indicator																	
	Collaborate w/ other Servers, Switch		SW-defined, Hyperconverged configs															
	Cloud data centers		Data caching, remote VS local, hybrid, etc. How to actually measure the energy efficiency?															
	Object storage		Is market large enough?		Is growing, e.g. S3. Plug-ins available SPEC Storage 2020													
8	Partner Collaboration/Tracking	ESTAR, ITI/ TGG (incl 80PLUS, Digital EU), EU Lot 9, ASHRAE, SPEC-Storage/Power, SNIA-Jpn TopRunner, ISO, ----->																

Green Storage TWG Membership as of 12-Jan-2024

- Calypso Sysyems
- Dell, Inc.
- Ellisys Group SA
- Fujitsu America
- HPE
- Hitachi
- Huawei Technologies
- IBM
- JetIO Technology
- Kioxia Corp.
- Leil Storage
- Micron Technology Inc.
- NetApp Inc.
- Pure Storage
- Quantum Corp. USA
- Samsung Electronics
- Seagate Technology
- Solidigm
- Toshiba America
- Ultrastrattech

Green Storage TWG Participation

- What is the expected industry impact of this work
 - One architecturally unbiased test methodology to serve regulatory bodies worldwide
 - Proactively provide a single test methodology worldwide
 - Industry knowledge of storage system power consumption and best practices/configurations to optimize power usage w/o compromising system functionality
- What is the industry segment relevance
 - Storage System Manufacturers; Storage Device Manufacturers; DCIM SW Vendors
- Why you should join and participate in Green Storage TWG
 - Participate in developing Standards used worldwide for datacenter data storage power efficiency
 - Influence regulations worldwide related to datacenter data storage power efficiency
 - Refresh and renew focus on best practices (whitepapers, planning tools)
 - Maintain / create competitive advantage in product sustainability
 - Avoid being surprised when a new regulation goes live and affects your product portfolio/revenues
- Who to contact for additional information
 - GTWG Co-chairs: Don Goddard, Donald.Goddard@netapp.com
 - Carlos Pratt, cpratt@ultrastratech.com