![SNIA logo]

GREEN STORAGE TWG

2022 Review and 2023 Plans

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Green Storage TWG 2022 Accomplishments

[Green Storage TWG Charter link](#)

- Recent completed work – summary:
  - Supported 2021 EPA DCS Unit Shipment Report Submissions; 2022 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
  - Released in July the new White Paper #86 (w/ TGG) "Energy Efficient Data Center Storage"
  - Released in October a SNIA Technical White Paper "Storage Device Level Power Efficiency Measurement"
  - Worked towards a revised test methodology for block level Storage Systems (Emerald future)
  - Worked towards a new test methodology for Storage Devices

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Green Storage TWG ROADMAP- 2023

Approximate and subject to change

#	Events	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Q1	Q2	Q3
							CY2023								CY 2024	
1	SNIA-GTWG F2F							▽ vF2F			▽ vF2F			▽ SNIA Member		
	Invite EPA to concall															
2	EPA-SNIA Industry Meetings		▽ EPA call-in to SNIA (SW cadence)							...as needed...				▽ DCS Stakeholder Meeting (virtual)		
3	ENERGY STAR Data Analysis (on file submittals)		Note: currently 12 file submittals							▽ V2.0/2.1 data analysis						
4	ISO version of Emerald 4.0 (tentative)									Submit to ISO		▽		▽ Publish ISO standa		
5	Emerald Measurement Spec v5.0									▽ Define scope					▽ Spec V	
	Vdbench replacement			▼		data collection ▽									(internal	
6	Storage Device Level Power Efficiency Measurement (SDLPEM)										▽ Draft Spec					
	On going data collection															
7	Futures															
	Memory attached persistent storage			Investigate and make recommendations										Consider for v5.0		
	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, Oracle, DMTF													

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Green Storage TWG Membership as of 18-Jan-2023

- ActionSpot
- Calypso Systems
- Dell, Inc.
- Fujitsu America
- HPE
- Hitachi
- Huawei Technologies
- IBM
- JetIO Technology
- Kioxia Corp.
- Marvell
- NetApp Inc.

- Oracle Corp.
- Pure Storage
- Quantum Corp. USA
- Samsung Electronics
- Seagate Technology
- Solidigm
- Toshiba America

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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 Herb Tanzer, herbtanz@gmail.com

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