



GREEN STORAGE COMMUNITY (formerly, Green Storage Initiative)

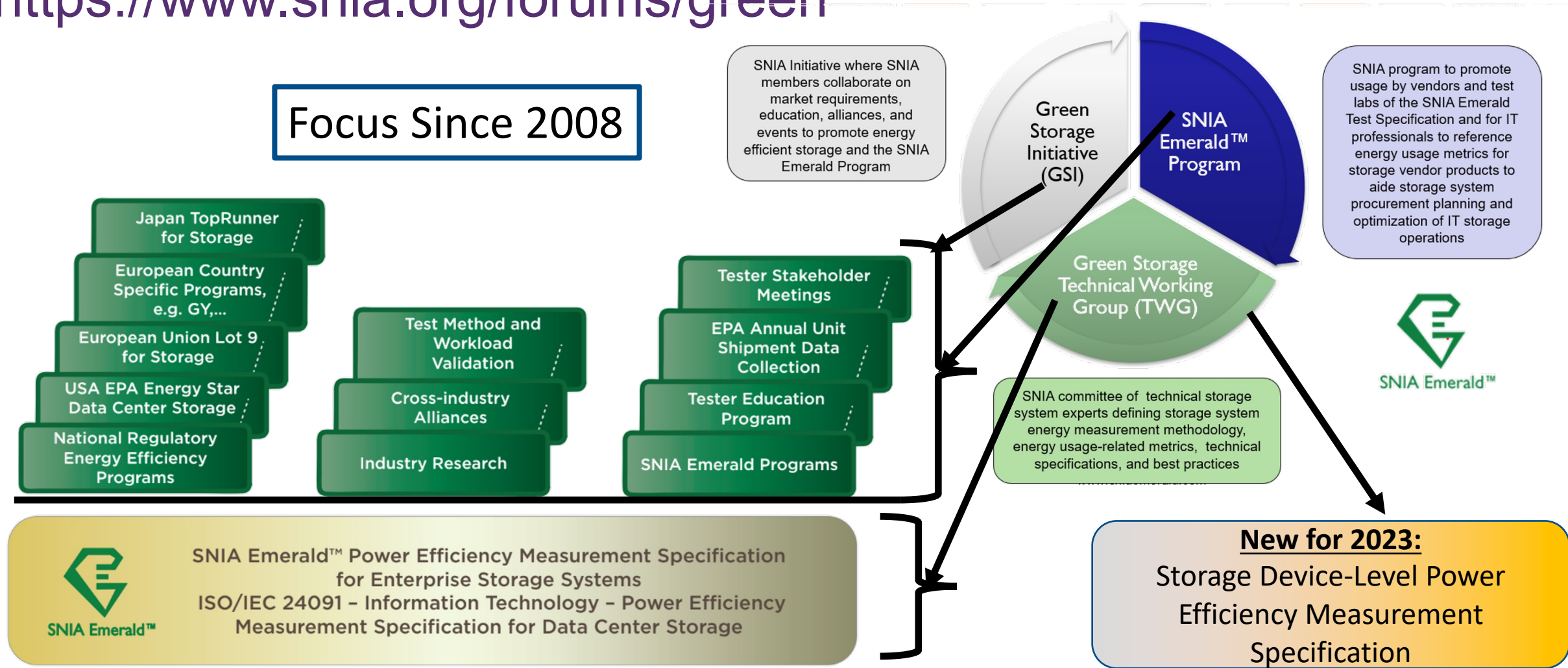
2024 Review and 2025 Plans

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Green Storage Initiative (GSI) Mission

<https://www.snia.org/forums/green>



Test Once, Report Many – Single WW Test Methodology; Regional Requirements

GSI Work Items (slide 1 of 2)

2023-2024 Accomplishments

Completed: SNIA Emerald 5.0 planning for 2024

- **DONE:** Block IO workload tool replacement
 - vdBench → Calypso Test Suite
- **DONE:** File IO workload tool replacement
 - SPEC SFS 2014 → SPEC Storage Solution 2020
- TGG Alliance / EU Lot 9 regulations, EU other
- Data Analysis and Recommendations – SNIA-J for TopRunner.
- EPA Data Analysis DCS 2.1
- White paper for Storage Device-Level Power Efficiency Measurement (SDLPEM) translated Japanese
- SDLPEM Taxonomy and Test Methods

2025 Plans

- Complete SNIA Emerald 5.0 development
 - Modernizing tools and workloads a priority
- TGG Alliance / EU Lot 9 regulations
- EPA DCS Unit Shp Report for 2023&24
- Industry Stakeholder Meetings
- Tester Community Training for new SNIA Emerald V5.0 tools
- SDLPEM V1.0 Specification
 - Calypso Test Suite
 - Vendor Testing

<div> Green Storage TWG ROADMAP- 2025 Approximate and subject to change Update 01-07-2025 </div>		CY2025												CY 2026				CY2027
#		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Q1	Q2	Q3	Q4	
1		SNIA-GTWG F2F		▽ vF2F				▽ vF2F			▽ vF2F			▽	SNIA Member Symposium Jan '26			
		Invite EPA to concall																
2		EPA-SNIA Industry Meetings						...as needed...						▽	DCS Stakeholder Meeting			
3		ENERGY STAR Data Analysis (on file submittals)									▽	V2.0/2.1 data analysis						
4		Emerald Measurement Spec v5.0		▽ Spec V5.0		▽ Spev V5.0		▽ Sbm for SNIA		▽ Publication								
		CTS lite replacement for Vdbench		(internal draft)		Public review		Approval										
		Update to Spec Storage 2020																
5		ISO version of Emerald 5.0 (tentative)												▽		▽	Publish ISO standard based on Emerald 5.0	
														Submit to ISO				
6		Storage Device Level Power Efficiency Measurement		▽ Spec V1.0		▽ Submit for SNIA		▽ Publication										
				Public review		Approval												
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, ----->														

USA EPA Energy Star Data Center Storage v2.0 Test Reports, based on SNIA Emerald v4

<https://www.energystar.gov/productfinder/product/certified-data-center-storage/results>

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2025 81 Test Reports 9 Vendors (Jan)
2024: 72 Test Reports 9 Vendors (Jun)
2023: 57 Test Reports 8 Vendors (Jun)

EPA Energy Star Program:

- Focus is systems with sellable SKU
- Block IO and File IO
- Vendor voluntary participation
- Results independent certification
- US Gov procurement priority

- Focus does not include composable systems, in-house proprietary designs, or consumer products.

GSI Work Items (slide 2 of 2)

GSI Alliances and Cross Industry Work

Technology and Testing

- SPEC (SFS), Oracle (Vdbench (SPC community)), SPEC (power meters), S-FLOW, 80 Plus Ecova/EPRI (power supply testing), Calypso Testers, Quarch

Policy

- The Green Grid (+Digital Europe) (EU, EU country level pgms)
- SNIA-J (Japan)

Industry Regulatory

- EPA Energy Star (USA)
- TopRunner (Japan) (via SNIA-J)
- EU Lot 9 (via TGG → Digital Europe), Blue Angel, ETSI, others

International Standards

- SC39 / ITS 39

GSI/GreenTWG Cross-SNIA Group Collaboration

■ S3 TWG/CMSI

- Solid state storage taxonomy
- S3 Test Methods/data collection

■ SFF TA TWG (to be done)

- EDSFF: Enterprise and Datacenter Standard Form Factor – Test Devices

Challenges and Opportunities for 2025

- Retain Single Test in all Geographies (system and roll-out device)
 - If NO, then vendor costs increase to retain revenue streams in regulated geographies
- Recruit New and Retain Existing volunteers
 - Inability to take on new work and alliances such as OCP, regional policy setting groups
 - Green Programs rely on engineering resources and vendor members in-house test engineers and lab equipment
- Timetables and alignment with regional policy setting groups
 - Testing of specifications to validate fairness and overall quality assurance for repeatability in diverse test harness configurations w/o spec fixes
- Opportunity to expand beyond TWG work
 - Re-establish Green Storage Committee – marketing, alliances, market requirements, public speaking, tech notes/whitepapers/tech opinions

Green Community Participation

- What is the expected industry impact of this work
 - One architecturally unbiased system and device test methodology to serve regulatory bodies worldwide
 - Industry knowledge of storage system and enterprise device power consumption and best practices/configurations to optimize power usage w/o compromising system functionality
 - **Opportunity to expand focus beyond TWG specification work:** data center and data best practices, regional policy advice, TCO Circularity, Capacity Optimization updated metrics/impact, lifecycle assessments with common baselines,
- What is the industry segment relevance
 - Storage System Manufacturers; Storage Device Manufacturers; DCIM SW Vendors
 - **With expanded work:** regional policy setters, data center IT planners, data lifecycle planners
 - **With expanded work:** whitepapers, webinars, selected trade event presentations
- Why you should join and participate in Green Community
 - Funnel and vet industry requirements into programs, alliances, and new/expanded technical work
 - Access to program mgt, data analysis, test validation, and industry training; industry awareness of your company's leadership
 - Refresh and renew focus on best practices (whitepapers, planning tools)
 - Avoid being surprised when a new regulation goes live and affects your product portfolio/revenues or supply chain
- Who to contact for additional information
 - Wayne M. Adams, greenchair@snia.org
 - Green Community SNIA Emerald Program Manager, David Thiel, emerald@snia.org