

ISO/IEC JTC 1 "Information technology"

Secretariat: ANSI

Committee manager: Rajchel Lisa Mrs.



SC 39 Business Plan 2025

Document type	Related content	Document date	Expected action
Project / Other	Meeting: Chengdu (China) 10 Nov 2025	2025-09-21	COMMENT/REPLY by 2025-10-13

Description

This document is circulated for review and consideration at the November 2025 JTC 1 Plenary.

ISO IEC JTC1 SC39 – Sustainability, IT and Data Centers

Strategic Business Plan

1.0 Executive Summary

ISO/IEC JTC 1/SC 39: Sustainability for and by Information Technology, this subcommittee operates under the joint umbrella of ISO and IEC's JTC 1. Its remit covers sustainability-oriented aspects of IT, with a strong focus on data centers and broader IT infrastructures. SC 39 focuses on standardizing assessment methods, design practices, and operational/management aspects to enhance resource efficiency, resilience, and environmental sustainability of IT systems, including data centers and supporting infrastructures. SC 39 continues to develop standards for Sustainability, IT and data centres. The committee meets annually and working groups meet twice a year and hold teleconferences to progress the work. JTC 1/SC 39 will continue to develop key performance indicators and best practices for data centres. The work spans multiple Sustainable Development Goals, such as Clean Energy, Sustainable Cities, Climate Action, and Responsible Consumption and Production. Subcommittee's structure includes three working groups: Working groups include WG 1 (Resource Efficient Data Centres), WG 3 (Sustainable Facilities and Infrastructure), and WG 4 (Eco-design of Digital Services). SC 39 engages in extensive liaison with related ISO/IEC technical committees (e.g., SC 42 on AI; TC 207 on environmental management) and external groups (e.g., ITU-T, ETSI, and The Green Grid). SC 39's efforts primarily address the following markets: Data centers and broader IT infrastructure—especially those funded by organizations aiming to enhance efficiency and sustainability. ICT product manufacturers, for guidance on eco-design and greener product lifecycles, Facility operators and service providers, benefiting from standardized best practices (e.g., metrics like PUE, WUE, ERF and REF), and Cross-industry sectors—such as education, transportation, and building—adopting IT to reduce environmental footprints.

2.0 Environment

Sustainability is central to SC 39's mission to meet the evolving needs of data centre stakeholders. Our standards focus on quantifiable metrics—such as energy and water efficiency—to drive best-in-class performance across facilities. As technologies like cloud computing, AI, smart cities, and IoT reshape IT infrastructure, the demand for sustainable, high-performing data centres continues to grow. Governments, businesses, and users increasingly expect improved productivity with reduced energy and resource consumption, making sustainability a core business driver for data centre operations and upgrades.

The UN IPCC's climate targets underscore the urgency of this work. While data centres currently measure electricity usage, broader lifecycle impacts—such as embodied carbon from materials and systems—are often overlooked.

Environmental concerns around IT are gaining prominence. The complexity of sustainability spans manufacturing, cooling, power transmission, telecom, and server management—each with cost and environmental trade-offs. These challenges require globally harmonized standards and practical solutions.

Market dynamics are accelerating. AI workloads are driving explosive growth, with data centre capacity projected to increase 33% annually through 2030—70% of which will support advanced AI. EMEA alone is expected to grow at 25% CAGR through 2027. Sustainability is now a top priority, with green data centres adopting energy-efficient hardware, liquid cooling, and renewable energy. Emerging trends include AI-driven optimization, low-carbon power adoption, and circular economy practices like heat reuse and lifecycle carbon tracking.

Infrastructure constraints are intensifying. Power, water, and land availability are under pressure. A single 100MW facility can consume up to 2 million liters of water daily, and global data centre water demand is expected to double by 2030.

Regulatory and voluntary initiatives are expanding. In the UK, experts advocate mandatory reporting of energy, water, and carbon usage (PUE, WUE and CUE). In the European Union, the Energy Efficiency Directive and implementation Regulation require data centers to report on environmental performance metrics, and the EU Climate Neutral Data Centre Pact (a voluntary initiative) has set targets for carbon-free energy, heat reuse, water usage and IT equipment end of life management and circularity. China's Renewable Portfolio Standards require up to 80% renewable energy in key regions.

Green IT investment is also rising. Organizations are allocating sustainability budgets to digital initiatives, with the digital sustainability market projected to reach US\$34 billion by 2027. Enterprise IT emissions could grow from 1% to 14% of global GHG emissions by 2040.

Stakeholder expectations are evolving. Customers demand transparency and actionable insights into their digital infrastructure's environmental footprint. Regulators seek standardized metrics for compliance and policy development. Infrastructure operators face technical and environmental challenges, especially around cooling, renewable energy integration, and site selection.

SC 39's KPIs—such as PUE, REF, CER, CUE, and WUE—are increasingly reflected in European frameworks like ETSI and EN 50600, highlighting the need for harmonized global standards. Industry-led initiatives like the EU Climate Neutral Data Centre Pact reinforce SC 39's role in setting recognized frameworks and best practices.

The urgency for robust standards is clear. AI-driven growth, sustainability pressures, and regulatory demands require accelerated development of eco-design (TS 20125), cooling guidance (CD 22237-7), and refined KPIs. SC 39 must continue to evaluate its scope to include and expand from water usage, carbon accounting, and circular economy metrics, while strengthening collaboration with SC 42, ETSI, CEN/CENELEC, and policy bodies.

SC 39 is well-positioned to lead global sustainability standardization in IT and data centres, especially as multiregional market growth and regulatory frameworks converge.

3.0 Achievements and benefits of ISO/IEC JTC1/SC39

3.1. Key Achievements by Working Groups:

WG 1 – Resource Efficient Data Centres

Published Standards:

- ISO/IEC TR 20913: Guidelines on holistic investigation methodology for data center key performance indicators
- ISO/IEC 21836: Server energy effectiveness metric
- ISO/IEC TR 21897: Impact of the ISO 52000 series on energy performance buildings
- ISO/IEC TR 23050: Impact on data center resource metrics of electrical energy storage and export.
- ISO/IEC 23544: Application Platform Energy Effectiveness (APEE)
- ISO/IEC 30134-1: Overview and general requirements
- ISO/IEC 30134-3: Renewable Energy Factor (REF)
- ISO/IEC 30134-4: IT Equipment Energy Efficiency for servers (ITEEsv)
- ISO/IEC 30134-5: IT Equipment Utilization for servers (ITEUsv)
- ISO/IEC 30134-6: Energy Reuse Factor (ERF)
- ISO/IEC 30134-7: Cooling Efficiency Ratio (CER)
- ISO/IEC 30134-8: Carbon Usage Effectiveness (CUE)
- ISO/IEC TR 30132: Part 1: Guidelines for energy effectiveness evaluation
- ISO/IEC TR 30133: Practices for resource-efficient data centres

Ongoing Projects:

- ISO/IEC 30134-2: Power Usage Effectiveness (PUE)
- ISO/IEC 30134-9: Water Usage Effectiveness (WUE)
- ISO/IEC TS 8236-1: Forecasting & Management of IT Equipment Provisioning

Benefits:

- Enables quantifiable benchmarking of energy and water efficiency in data centres.
- Supports data-driven sustainability strategies for IT infrastructure.
- Facilitates regulatory compliance and voluntary efficiency programs globally.

WG 3 – Sustainable Facilities and Infrastructure

Published Standards:

- ISO/IEC 22237-1: General Concepts
- ISO/IEC 22237-2: Building construction
- ISO/IEC 22237-3: Power Distribution
- ISO/IEC 22237-4: Environmental Control
- ISO/IEC 22237-6: Security systems
- ISO/IEC TS 22237-30: Earthquake risk and impact analysis

Ongoing Projects:

- ISO/IEC CD 22237-5: Telecommunications cabling infrastructure
- ISO/IEC CD 22237-7: Management and operational information
- ISO/IEC AWI 22237-10: Maturity model for energy management and environmental sustainability
- ISO/IEC DTS 22237-31: KPIs for resilience
-
- ISO/IEC TS 8236-2: Facility infrastructure provisioning
- PWI 22237-44: Guidance for the application of liquid cooling to the data centres

Benefits:

- Provides a global framework for sustainable data centre design and operations.
- Aligns with regional standards (e.g., EN 50600 in Europe), promoting interoperability.
- Enhances resilience and operational efficiency of digital infrastructure.

WG 4 – Eco-design of Digital Services

Ongoing Project:

- ISO/IEC CD TS 20125: Eco-design of digital services

Future Work:

- ISO/IEC AWI TR 25953: AI and sustainable provisioning of IT and data centres

Benefits:

- Encourages sustainable software and service design. Supports green digital transformation across industries and lays the groundwork for certifiable eco-design standards.

3.2. Strategic Collaborations and Initiatives:

Joint Advisory Group (JAG) with SC 42 on AI and Sustainability: Exploring synergies between AI and sustainable IT practices. Identifying new work items such as “Green AI” and energy-efficient AI models.

Alignment with EN 50600: WG 3 is working to technically align ISO/IEC 22237 documents with European standards to ensure global applicability.

Participation in JTC 1 Foresight Workshop Recommendations: SC 39 participated in the JTC 1 Foresight Workshop Recommendations by contributing to two key strategic areas:

- Addressing AI Energy Consumption: SC 39, in collaboration with SC 42, was tasked with exploring new work items focused on sustainability in AI. This includes potential standards for energy-efficient AI models and “Green AI” practices, reflecting the growing environmental impact of AI workloads.
- Promoting Inclusivity and Accessibility: SC 39 was encouraged to integrate inclusivity and accessibility into its business planning and outreach efforts. This aligns with broader JTC 1 goal to ensure that standardization efforts reflect diverse global needs and perspectives.

Additionally, SC 39 was requested to report on its Joint Advisory Group (JAG) work with SC 42 at the November 2025 JTC 1 Plenary, highlighting its role in advancing sustainability and AI-related initiatives.

3.3. Alignment with Sustainable Development Goals (SDGs):

The work of ISO/IEC JTC 1/SC 39 directly contributes to several United Nations Sustainable Development Goals (SDGs) and aligns with the strategic priorities of both ISO and IEC. Through its standards for energy efficiency, resource optimization, and sustainable IT infrastructure, SC 39 supports SDG 7 by promoting affordable and clean energy practices in data centres and digital services. Its focus on resilient and sustainable infrastructure development aligns with SDG 9, fostering innovation and industrial advancement. By enabling smart city frameworks and sustainable urban IT systems, SC 39 contributes to SDG 11, helping build inclusive and sustainable communities. The subcommittee's emphasis on lifecycle-based eco-design and responsible consumption of digital resources supports SDG 12, while its efforts to reduce carbon footprints and improve environmental performance in IT operations directly address SDG 13 on climate action:

SDG	Contribution
SDG 7 - Affordable and Clean Energy	Promotes energy-efficient IT and data centre operations.
SDG 9 - Industry, Innovation and Infrastructure	Develops resilient and sustainable digital infrastructure standards.
SDG 11 - Sustainable Cities and Communities	Supports smart city infrastructure through sustainable IT practices.
SDG 12 - Responsible Consumption and Production	Encourages lifecycle-based eco-design and resource efficiency.
SDG 13 - Climate Action	Provides tools to measure and reduce carbon footprints in IT.

3.4. Alignment with ISO and IEC Strategies:

In addition to the SDGs, SC 39's work is closely aligned with ISO's Strategy 2030, particularly in the areas of climate action, digital transformation, and inclusivity and accessibility. The subcommittee's standards provide tools for organizations to measure and reduce environmental impact, support the sustainable evolution of digital infrastructure, and promote transparency and global applicability. Similarly, SC 39 contributes to the IEC Masterplan 2021 by advancing sustainable electrification and enabling smart, interoperable IT ecosystems. These strategic alignments ensure that SC 39's deliverables not only meet current market and regulatory needs but also anticipate future challenges in sustainability and digital innovation.

ISO Strategy 2030:

- Climate action: SC 39 standards help organizations measure and reduce environmental impact.
- Digital transformation: Supports the sustainable evolution of digital infrastructure.
- Inclusivity and Accessibility: Promotes transparency and global applicability of standards.

IEC Masterplan 2021:

- Sustainable electrification: SC 39 contributes to efficient energy use in digital systems.
- Smart infrastructure: Enables smart, interoperable, and sustainable IT ecosystems.

4.0 Participation and cooperation/collaboration.

We continue to receive interest and input from national bodies and liaisons, gaining traction on the topic and driving forward with ballots for data centre and IT facility standards. Industry and governments develop and acquire information on efficiency and energy consumption through voluntary programs and mandatory efforts of some national and local programs. However, that is still evolving as previously learned lessons impact upcoming regulations. Global KPI's, Taxonomy, and best-known practices are necessary for these efforts to not only improve efficiency but also provide standardized methods of continuous improvement in conjunction with a rapidly advancing technology landscape.

4.1 Membership Overview:

As of the May 2025 SC 39 Plenary in Seoul, ISO/IEC JTC 1/SC 39 continues to maintain a strong and active membership base. The subcommittee includes 25 Participating (P) Members and 15 Observing (O) Members, consistent with the previous year's figures. Attendance at plenary meetings remains robust, with over 20 National Bodies represented at each of the last two plenaries (April 2024 in Saint-Denis and May 2025 in Seoul), indicating sustained engagement and commitment from member countries.

The full JTC 1/SC 39 National Body membership list can be found [here](#).

JTC 1/SC 39 also works other ISO, IEC and JTC 1 committees as liaisons as well as other external organizations. A full list of liaisons is available [here](#).

4.2 Efforts to Increase Membership:

SC 39 continues to take several actions to broaden participation, including outreach to emerging economies and targeted engagement with industry stakeholders in regions experiencing rapid digital infrastructure growth. The subcommittee also leverages liaison relationships and joint advisory groups to attract experts from adjacent domains such as AI, smart cities, and sustainable manufacturing.

4.3 Resource Shortages and Succession Planning:

While SC 39 benefits from a dedicated core of experts, there is an ongoing need to recruit new participants to address attrition and evolving technical demands.

The subcommittee has identified succession planning as a strategic priority, as requested by JTC 1, and has begun developing a succession plan. SC 39 is exploring how to utilize existing training and mentoring programs, as well as identifying those that want to be a part of the development team, to ensure continuity and readiness of future leaders.

4.4 Liaison Relationships:

SC 39 maintains active liaison relationships with both internal ISO/IEC committees and external organizations. These relationships facilitate knowledge exchange, harmonization of standards, and collaborative development of new work items.

Liaison Partner	Type	Purpose/Comment
ISO/IEC JTC 1/SC 42	Internal	Joint Advisory Group on AI and Sustainability
ISO/TC 268	Internal	Smart Cities collaboration
IEC SyC Smart Manufacturing	Internal	Alignment on sustainable manufacturing standards
The Green Grid	External	Data centre maturity models and sustainability metrics
EN 50600 (CENELEC)	External	Regional alignment with European data centre standards

4.5 Collaborative Projects and Joint Work:

SC 39 is actively engaged in cooperative projects with other ISO and IEC committees. Notable current and past collaborations include:

- Joint Advisory Group (JAG) with SC 42: Focused on AI and sustainability, this group is exploring new work items such as “Green AI” and energy-efficient AI models.
- Alignment with EN 50600: WG 3 is working to technically align ISO/IEC 22237 documents with European standards to ensure global applicability.
- Smart Cities Ontology Seminar: SC 39 is contributing to a JTC 1-led seminar on terminology and ontology standards for smart cities, in collaboration with TC 268 and TC 268/SC 1.

These efforts reflect SC 39’s commitment to interoperability, global relevance, and strategic alignment with emerging technologies and sustainability goals.

5.0 Objectives of the ISO/IEC JTC 1/SC39 and strategies to achieve them.

ISO/IEC JTC 1/SC 39 aims to advance sustainability across IT and data centre infrastructure by developing international standards that improve energy, water, and resource efficiency. Looking to the future, the subcommittee is focused on expanding eco-design and lifecycle-based standards, supporting sustainable AI provisioning, and contributing to smart city frameworks through ontology and interoperability efforts. SC 39 also seeks to respond to growing regulatory and market demands by providing globally harmonized KPIs and reporting frameworks, while ensuring its standards are inclusive, accessible, and applicable across diverse regions and stakeholder groups.

- **Advance Sustainability in IT and Data Centres:** Continue developing standards that improve energy, water, and resource efficiency across digital infrastructure, including data centres, IT equipment, and digital services.
- **Expand Eco-Design and Lifecycle Standards:** When the TS 20125 is published, we will consider the creation of it as an international Standard. We also will assess broadening the scope of eco-design standards (e.g., TS 20125) to include lifecycle carbon accounting, circular economy practices, and cradle-to-grave sustainability metrics.
- **Support AI and Emerging Technologies:** Collaborate with SC 42 and other committees to address the environmental impact of AI workloads and develop standards for energy-efficient AI models and sustainable provisioning.
- **Enable Smart Infrastructure and Cities:** Contribute to smart city frameworks through ontology and interoperability standards that support sustainable urban IT systems.
- **Respond to Regulatory and Market Demands:** Provide globally harmonized KPIs and reporting frameworks to support compliance with emerging regulations and voluntary sustainability pacts (e.g., Climate Neutral Data Centre Pact, China's RPS).
- **Promote Global Adoption and Inclusivity:** Ensure standards are accessible, inclusive, and applicable across diverse regions and stakeholder groups.

To achieve these objectives, SC 39 must adopt a collaborative and agile approach. By engaging in joint projects with committees such as SC 42, ETSI, and CEN/CENELEC we will ensure interoperability and avoid duplication. The subcommittee need to continue to expand its participation through outreach to emerging economies and industry stakeholders and invest in leadership development via succession planning and training programs. SC 39 needs to accelerate standards development to keep pace with technological and regulatory changes and integrate lifecycle and circular economy principles into its work while aligning its efforts with ISO Strategy 2030 to support sustainability, inclusivity, and global relevance.

6.0 Factors affecting completion and adoption of the work program

While no major risks or issues have been realized, the following potential factors could negatively impact the completion of key projects or adoption of deliverables by ISO/IEC JTC 1/SC39:

6.1. Resource Constraints: Limited availability of expert contributors, especially in emerging technical areas like AI and lifecycle carbon accounting, may slow progress. Attrition of experienced members without sufficient succession planning could also hinder continuity.

6.2. Rapid Technological Change: The fast pace of innovation in AI, cloud infrastructure, and edge computing may outpace the development cycle of standards, making some deliverables obsolete before adoption.

6.3. Regulatory Fragmentation: Diverging national or regional regulations—such as differing carbon reporting requirements or renewable energy thresholds—could complicate global harmonization and reduce the applicability of SC 39 standards.

6.4. Market Adoption Lag: Even well-developed standards may face slow uptake if industry stakeholders lack awareness, incentives, or technical capacity to implement them, especially in small and medium enterprises.

6.5. Coordination Challenges: Insufficient collaboration or overlap with other ISO/IEC committees (e.g., SC 42, ETSI, CEN/CENELEC) could lead to duplication, conflicting standards, or missed opportunities for synergy.

6.6. Complexity of Sustainability Metrics: Developing universally accepted KPIs for sustainability requires consensus across diverse stakeholders, which can be time-consuming and contentious.

7.0 Structure, current projects, and publications

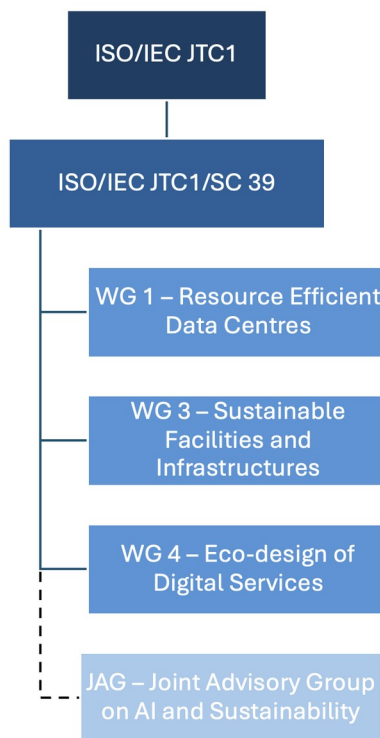
SC 39 operates under the umbrella of ISO/IEC JTC 1, which oversees standardization in information technology. Within SC 39, the subcommittee is structured into three specialized Working Groups (WGs) and one Joint Advisory Group (JAG). These groups focus on distinct areas of sustainability in IT and data centres:

WG 1 – Resource Efficient Data Centres: Develops standards and KPIs for optimizing energy and resource use in data centre operations.

WG 3 – Sustainable Facilities and Infrastructures: Focuses on the physical infrastructure of data centres, including construction, security, and operational sustainability.

WG 4 – Eco-design of Digital Services: Works on standards for designing digital services with minimal environmental impact across their lifecycle.

Joint Advisory Group (JAG) on AI and Sustainability: A collaborative initiative between SC 39 and SC 42 to explore the intersection of artificial intelligence and sustainability.



ISO/IEC JTC 1/SC39 has 31 published standards (including standard updates) and 10 standards under development. These can be accessed using the following link:

<https://www.iso.org/committee/654019/x/catalogue/p/1/u/0/w/0/d/0>

Standards under development along with their corresponding working group can be found in the following table:

Standard	Title	Stage	Working Group
ISO/IEC TS 8236-1	Provisioning, forecasting and management — Part 1: Data centre IT equipment	60.00 - Publication	WG 1
ISO/IEC TS 8236-2	Provisioning, forecasting and management — Part 2: Data centre facility infrastructure	60.00 - Publication	WG 3
ISO/IEC DTS 20125	Digital services ecodesign –	50.00 – FDIS Approval	WG 4

	Ecopractices for life cycle stages		
ISO/IEC DIS 22237-5	Data centre facilities and infrastructures — Part 5: Telecommunications cabling infrastructure	40.20 – DIS Ballot	WG 3
ISO/IEC CD 22237-7.2	Data centre facilities and infrastructures — Part 7: Management and operational information	30.20 – CD Consultation	WG 3
ISO/IEC AWI TS 22237-10	Data centre facilities and infrastructures — Part 10: Maturity model for energy management and environmental sustainability	20.00 – New Project	WG 3
ISO/IEC DTS 22237-31	Data centre facilities and infrastructures — Part 31: Key performance indicators for resilience	50.00 – FDIS Approval	WG 3
ISO/IEC AWI TR 25953	IT and sustainability — AI and sustainable provisioning of IT and data centres	20.00 – New Project	WG 4
ISO/IEC PRF 30134-2	Data centres key performance indicators — Part 2: Power usage effectiveness (PUE)	50.00 – FDIS Approval	WG 1
ISO/IEC AWI 30134-9	Data centres key performance indicators — Part 9: Water usage effectiveness (WUE)	20.00 – New Project	WG 1