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BUSINESS PLAN FOR JTC 1/SC 39

Sustainability for and by Information Technology

PERIOD COVERED: November 2015 – November 2016

1.0   Executive Summary

SC 39 continues to develop standards for the sustainability for and by information technology. The committee meets annually and its working groups meet twice a year in person and hold monthly teleconferences to progress their work. JTC 1/SC 39 will continue to develop key performance indicators for data centres.

2.0   CHAIRMAN'S REMARKS

2.1   Market Requirements, Innovation

The perfect storm expression still describes the work of climate change, data protection, cyber security, privacy, and trade agreements in negotiation as the IT industry is being pulled in a number of directions simultaneously. Cloud computing, smart cities (smart grid), electronic medical records, smart transport, big data, and IoT (Internet of things) are driving IT in general and data centres specifically in directions that are unanticipated. At the same time governments, businesses and users of IT equipment demand ongoing incremental productivity improvement in the workplace year over year, coupled with reduction in energy or resource consumption.

Businesses and governments have embraced the sustainability aspects IT technology could deliver. We have been asked do we want the same output with lower energy consumption or more output with the same energy consumption, the answer has been a resounding more output with lower energy consumption, this is the sustainable path.

Environmental issues, and IT's role, are receiving more attention than ever. Utilizing technology, and specifically IT technology as a more sustainable methodology, has different meanings whether you are a manufacturer, integrator, manager, government or user. We continue to question the space allocation of new equipment, cooling and power needs as well. Computer support infrastructure such as: power distribution, cooling, infrastructure management, telecom, and others dominate the discussion barely second to system price for the concerns of the data centre manager. The questions are complicated, and not easily resolved in a satisfactory manner to all.

Smart Cities, Smart Manufacturing (a.k.a Industry 4.0), eHealth, Smart Transport, Cloud Computing and other IT related global government policy initiatives continue to move forward and gain broader adoption. The growth of data centres, in number and size, still occurs and is inevitable since the data generated is also rising. Recently small and medium business migrating to the cloud has caused data centre consolidation to move beyond the concept into reality, and is accelerating. This consolidation allows reduction of consumed energy, infrastructure, and local premise equipment installation.   Industry articles and press continue the drumbeat for optimizing efficiency of data centres and a steady reduction of energy (e.g. water) consumption of IT equipment. To set effective local, jurisdictional or national efficiency requirements governments will need resource efficiency standards to frame the topic, limits and requirements. Few standards exist today on this topic, and, none of which are international standards. For that JTC1 SC39 will be first.

We continue to receive interest and input from national bodies and liaisons, gaining traction on the topic and diving forward with DIS ballots for data centre standards in 2015. 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 from previous years as lessons learned impacts legislation and regulations in development. Global KPI's, vocabulary and Taxonomy are absolutely necessary in these efforts.

2.2   Accomplishments

In this period, JTC 1/SC 39 has published the following documents:

| ISO/IEC TR 30132-1:2016 | Information technology – Information technology sustainability – Energy efficient |

	computing models – Part 1: Guidelines for energy effectiveness evaluation
ISO/IEC 30134-1:2016	Information technology – Data centres – Key performance indicators – Part 1: Guidelines for energy effectiveness evaluation
ISO/IEC 30134-2: 2016	Information technology – Data centres – Key performance indicators – Part 2: Power usage effectiveness (PUE)
ISO/IEC 30134-3:2016	Information technology – Data centres – Key performance indicators – Part 3: Renewable energy factor (REF)

2.3   Resources

The Plenary of JTC 1/SC 39 and the meetings of its working groups continue to be well attended.   The two working groups of JTC 1/SC 39 are also well attended and have representation from most of the National Bodies of JTC 1/SC 39.

2.4 Competition and Cooperation

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.

A particular challenge for JTC 1/SC 39 is its relationship with ITU-T Study Group 5. ITU-T SG 5 has developed a standard, L.1302 which describes the usage of PUE and pPUE that are not in compliance with ISO/IEC 30134-2:2016. JTC 1/SC 39 provided ITU-T SG 5 with comments detailing the committees concern but no response was received to the comments.

3.0   Working Groups

3.1   WG 1 – Resource Efficient Data Centres

JTC 1/SC 39/WG 1 manages the development of key performance indicators for resource efficient data centres. JTC 1/SC 39/WG1 programme of work can be found at (*SC Program of Work.*).

3.1.1   WG 1 Accomplishments

WG 1 completed work on the following:

- IS 30134-1, Requirements for data centre resource efficiency key performance indicators,
- IS 30134-2, Data Centre KPI, Power Usage Effectiveness (PUE)
- IS 30134-3, Data Centre KPI, Renewable Energy Factor (REF)
- TR 20913, Holistic Approach to Data Centre Operations

WG 1 Finalized & Dispositioned Committee Drafts (CD) on:

- 30134-4, Data Centre KPI, IT Energy Efficiency-Servers (ITEE$_{sv}$)
- 30134-5, Data Centre KPI, IT Energy Utilization- Servers (ITEU$_{sv}$)

Each are to be update and submitted for DIS consideration as international standards by the end of 2016.

WG 1 has investigated and is pursuing the following work items for 2016-2017, which includes:

- 30134-6, Data Centre KPI, Energy Reuse Factor (ERF)

- TR 30133, Guidelines for Resource Efficient Data Centres
- 21836, Server Energy Efficiency Metric (SEEM)
- TR regarding Primary Energy
- PDAM for 30134-1, -2, -3 to clarify and specify logical and physical boundary conditions
- TR regarding use of excess energy generation
- Update and internationalization of EN 50600 series of specification

3.1.2 WG 1 Deliverables

WG 1 deliverables include:

- Committee drafts and DIS proposals on:
  - 30134-6, Data Centre KPI, Energy Reuse Factor (ERF)
  - 21836, Server Energy Efficiency Metric (SEEM)
  - PDAM for 30134-1, -2, and -3
  - TR 30133, Guidelines for Resource Efficient Data Centres
- Program recommendations on:
  - Primary Energy
  - Excess Energy Generation
  - Internationalization and update to EN 50600 (including NWIPs)
- Disposition NWIP candidates (i.e. hold, drop, or NWIP). Note that based on contributions some may be issued as NWIPs, though many remain on hold until resources are available.:
  - Water Usage Effectiveness (WUE)
  - Carbon Usage Effectiveness (CUE)
  - Water Reuse Factor (WRF)
  - Data Centre Cost eXpense (DCCX)
  - Data Centre Cost Effectiveness (DCCE)
  - Cooling Effectiveness Ratio (CER)
  - Data Centre Utilization (DCU)
  - IT Equipment Effectiveness Networking (ITEE$_{netw}$)
  - IT Equipment Utilization Networking (ITEU$_{netw}$)
  - IT Equipment Effectiveness Storage (ITEE$_{stor}$)
  - IT Equipment Utilization Storage (ITEU$_{stor}$)
  - Seasonally adjusted Energy Efficiency Ratio (SEER)
  - Coefficient of Performance (COP)
  - TR Economic Output
  - TR Resiliency Risk Impact
  - DC Life Cycle Impact
  - Waste Impact to Local Area
  - Resiliency Class or Type of Data Centre
  - Security and Privacy
  - Boundaries of Software Defined Data Centre
  - Boundaries of Software Defined Subsystems
  - DC Integration for Smart Cities

- o   DC and IoT integration

3.1.3   WG 1 Risks, Opportunities and Issues

WG 1 issues/challenges:

- Conflicting and competing standards (e.g. ITU-T, ETSI, ENERGY STAR, Eco-Design directive, etc…)
- Additional regional resources (Singapore, Malaysia, Australia/NZ, Brazil, Argentina, etc…)
- Integration and updates due to new technologies (e.g. SDN, 5G, high density/low cost Non-volatile Memory)
- Integration of specifications and technology related to data centres but driven by other groups (e.g. Software Defined DC, Smart Cities, IoT, Hybrid cloud, Open Compute)

WG 1 continues to work these issues and challenges through our liaisons.

3.2   WG 2 – Green ICT

JTC 1/SC 39/WG 2 manages the development of green ICT standards.   JTC 1/SC 39/WG2 programme of work can be found at (*SC Program of Work.*).

3.2.1   WG 2 Accomplishments

WG 2 completed the following Technical Report.

ISO/IEC TR 30132-1:2016	Information technology – Information technology sustainability – Energy efficient computing models – Part 1: Guidelines for energy effectiveness evaluation

WG 2 expects to further develop the remaining two parts additionally to ISO/IEC TR 30132-1:2016 and solicits contributions to make them forward.

3.2.2   WG 2 Deliverables

WG 2 has maintained a landscape document of Green ICT-related standards compiled from various SDOs, identified by the following categories and summarized by their scopes:

- Guidance for standards and specifications writers
- Eco design, i.e. environmentally-conscious design
- Eco declaration, i.e. declaration of environmental information
- Material declaration
- Life Cycle Assessment (LCA)
- LCA-based footprinting
- LCA-based ICT product footprinting
- ICT-enabling effects quantification
- GHG inventory of organizations
- GHG inventory of ICT organizations
- GHG inventory of projects
- GHG inventory of EE-based projects
- GHG inventory of ICT projects

- Validation and Verification
- Hazardous materials avoidance
- ICT product power consumption measurement
- ICT product energy efficiency metrics and measurement
- ICT product energy efficiency improvement
- ICT product energy efficiency measurement
- ICT network energy efficiency improvement
- ICT network energy efficiency measurement
- Power adapter
- Data centre Direct Current feeding
- Data centre guidelines
- Data centre energy management parameters
- Data centre energy efficiency measurement
- Vocabulary
- GHG monitoring
- Smart Grid
- E-waste management
- Adaptation to climate change

3.2.3   WG 2 Risks, Opportunities and Issues

The sustainability issue has been requested to be considered in the industrial sector as well as the social sector. For example, industry customers have requested their vendors to handle energy efficiency for both factories and products. One of challenges of smart city projects in the world is energy efficiency management and GHG mitigations.