



IBM Corporate Environmental Affairs

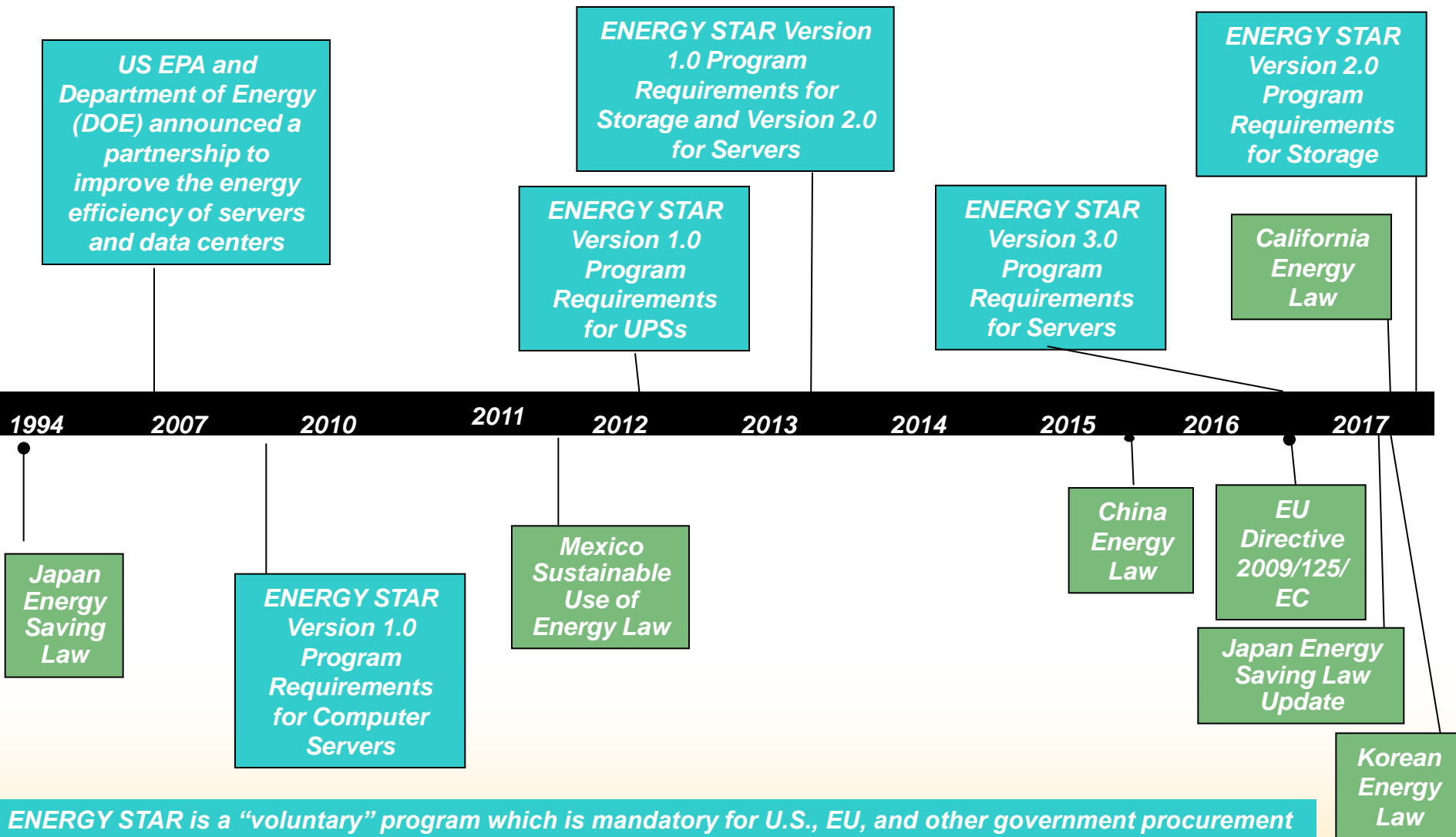
LOT 9 and MANDATE 462 DISCUSSION



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Regulation Timeline for Storage and Server Products



ENERGY STAR is a “voluntary” program which is mandatory for U.S., EU, and other government procurement

All Other Entries represent current or future legal requirements which must be met for market access.

EU Energy Related Products Lot 9 and Mandate 462

■ **Task 7 Study Document: Scenarios is being finalized**

– Servers:

- Looking at 1 and 2 processor managed and unmanaged servers for regulation.
- 4 socket and resilient servers are currently still under consideration, but may be excluded because of unit sales.

– Storage:

- Appears to be moving toward limiting covered storage products at OL-2 (Flash) and OL-3 (Storwize V3700)
- OL-4 is still under consideration.
- Exclude OL-4 to OL-6 storage products
- Task 7 review expresses concern about storage complexity and the minimal amount of available Emerald data.

– Network: Out of Scope for this study

■ **Several Activities are in process:**

- Task 7 Document: Consultant has acknowledged that the three DC IT products types are complex with large configuration ranges across each product group.
 - Suggests limiting requirements to power supply efficiency requirements and data reporting with further study.
- EU Directorate has stated its intent on adding material and life-cycle requirements to the regulations
 - Publication of the JRC Science and Policy Report: Environmental Footprint and Material Efficiency Support for Product Policy.
 - Request to ETSI and CEN/CENELAC to prepare material standards for server and storage products under ErP.
- Analysis of standards for measuring server and storage product efficiency:
 - Intertek study: Next phase to evaluate available test methods for server and storage product efficiency
 - Mandate 462: ETSI group creation of a European standard for server and storage product energy efficiency
- Directorate needs to build regulatory scenarios for final analysis:
 - Voluntary program
 - Data Reporting
 - Mandated Thresholds

TGG/ITI Activities

- **Continue Collaboration with ITI, Digital Europe and Emerald TWG on Lot 9 Activities**
- **Emerald Analysis Activities:**
 - Complete Green Grid Emerald Analysis White Paper: 1Q2016
 - Document the analysis presented in the chart deck today
 - Determine if quantitative data on Capacity Optimization Methods (COMS) can be gathered/presented.
 - Continue to Collect Available Emerald Data and Incorporate into the TGG data base.
 - Continue Collaboration with SNIA TWG on Storage Energy Efficiency
- **SERT Analysis Activities**
 - Continue SERT data collection process (if process can be worked out)
 - Analyze aggregation methodologies and potential thresholding approaches
 - Market exclusion
 - Market recognition
 - Determine if resource is available for further SERT analysis work:
 - Comparing results between max power and high-end performance and low power and low-end performance configurations.
 - Influence of channel count and memory bandwidth
 - Working with JEITA and CNIS on server efficiency requirements based on SERT results.
- **Group intends continue to provide data based technical advice on regulatory approaches**

VOLUNTARY DATA CENTER ENERGY EFFICIENCY INITIATIVES

■ EU DATA CENTER CODE OF CONDUCT:

- Data Center Efficiency Improvement Plans:
 - 15-18 Mandatory Requirements
 - 62-65 Voluntary or Continuous Improvement Requirements
- Reporting of PUE and Energy Use to Directorate; no public release of data
- <http://iet.jrc.ec.europa.eu/energyefficiency/ict-codes-conduct/data-centres-energy-efficiency>

■ National Australian Built Environment Rating System (NABERS) for Data Centers

- 6 Star Rating System with Three Rating Tools: IT Equipment, Infrastructure, and Whole Facility
- Benchmark and Assess Actual Performance
- <http://www.nabers.gov.au/public/WebPages/DocumentHandler.ashx?docType=3&id=79&attId=0>

■ USEPA ENERGY STAR Building Portfolio Data Center Rating:

- Requires Metered Tracking of all DC Energy Use no matter how small.
- Establishes a DC Rating Based on PUE; Top 25% of performers receive ENERGY STAR recognition
- http://www.energystar.gov/index.cfm?c=prod_development.server_efficiency

■ Japan Data Center Performance Per Energy (DPPE) Metric

- Incorporate IT Equipment Utilization and Efficiency, Cooling Efficiency & Use of Renewable Energy
- Intended to Benchmark and Assess Data Center Performance
- http://home.ieita.or.jp/greenit-pc/topics/release/pdf/dppe_e_20100315.pdf

■ U.S. Department of Energy Better Building Challenge for Data Centers

- Commit to reduce PUE of designated data centers by 20% by 2024.
- Publicly showcase a data center with significant efficiency gains within 9 months of joining program.
- Make an annual report on progress.

■ Singapore Green Data Centre Standard

- Plan/Do/Act/Check approach to data center management
- Sets Energy Efficiency Metrics
- <https://www.ida.gov.sg/Programmes-Partnership/Store/Green-Data-Centre-Standard>