

ENERGY STAR® for UPS - Draft 1 Initial APC Comments

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Thank you for the opportunity to comment!

- The spec development process is working well
- We look forward to continued dialog and cooperation with EPA
- We will submit more detailed written comments on Draft 1 by the May 27 deadline

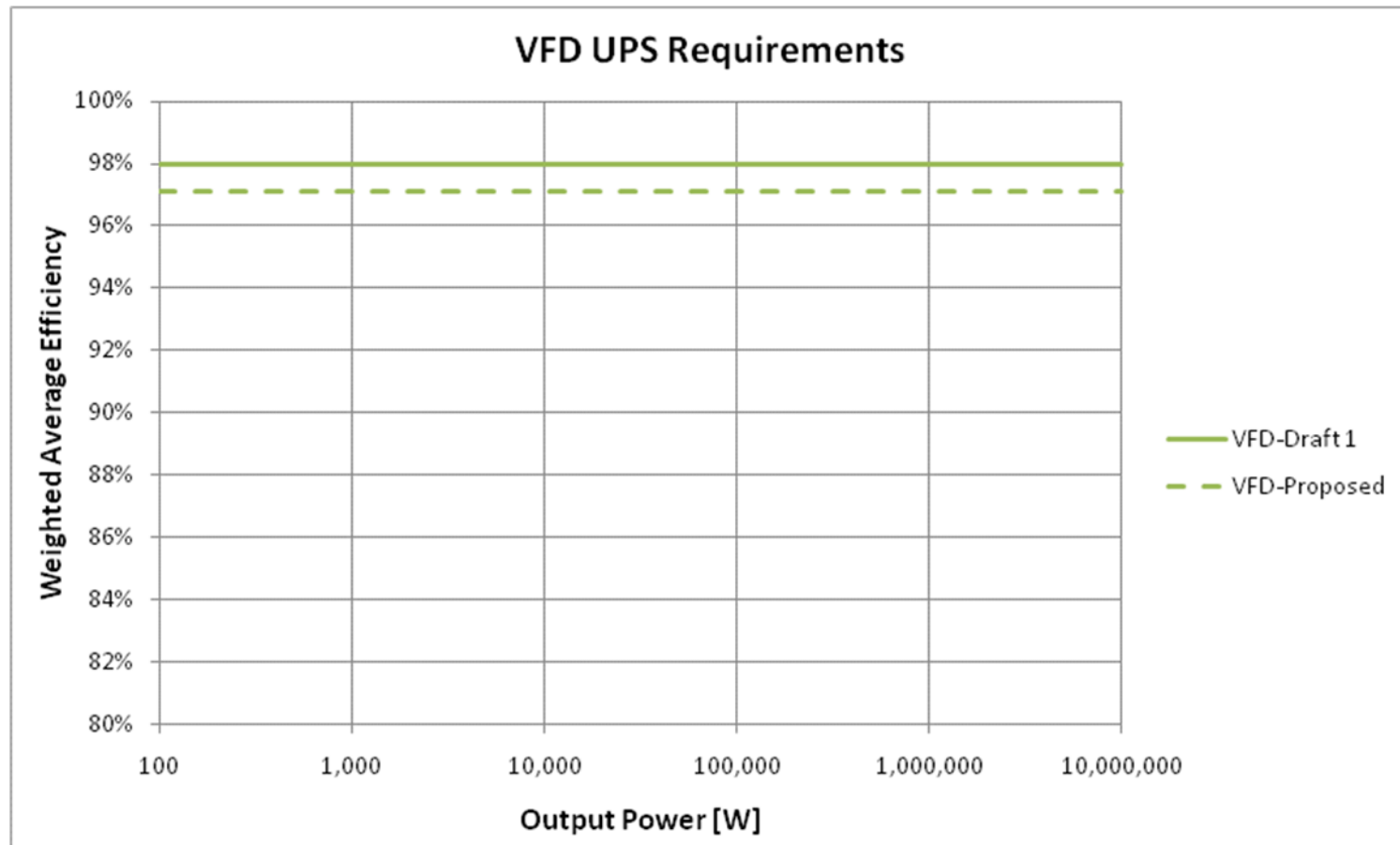
Requirements May Be Too High

- Waiting for EPA to release anonymized data set for independent analysis
 - In progress
- Miscategorization of UPSs could be part of the problem
 - Need to cross check topology with performance categorization and reclassify or disregard, suspicious products
- Products need adequate margin above requirements
 - Covers normal unit to unit variations
 - Especially important in light of new CB and DOE verification programs
- The higher the limits, the lower the participation
 - Vendors may choose to play it safe rather than risk verification failures
- Current simple proposals ignore voltage and capacity for many types
 - Simple is good but needs to be lower to cover corner cases

VFD Proposal

Lower requirement by 1%

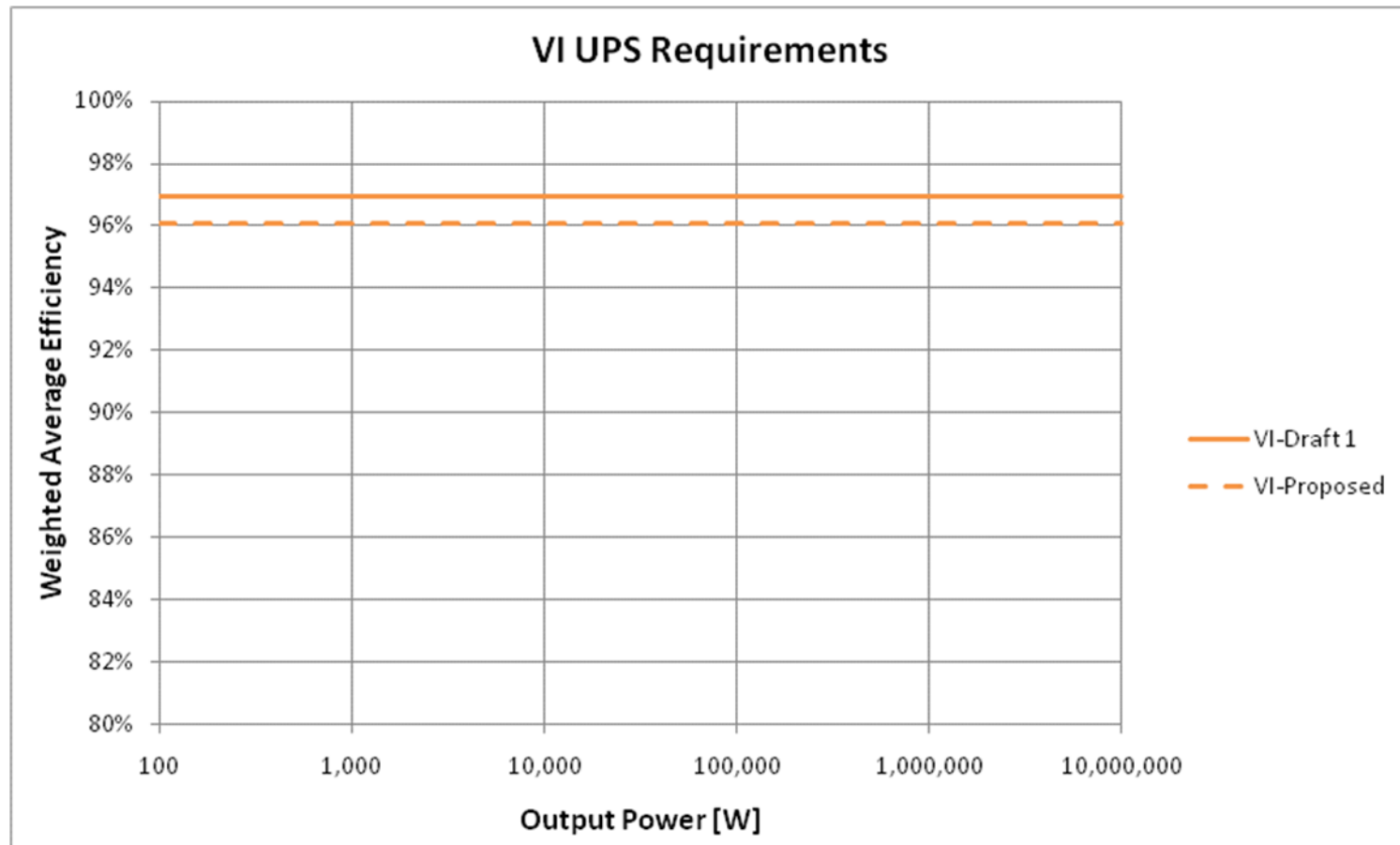
- Draft 1 requires 98% Weighted Efficiency
- Propose reduction to 97% Weighted Efficiency



VI Proposal

Lower requirement by 1%

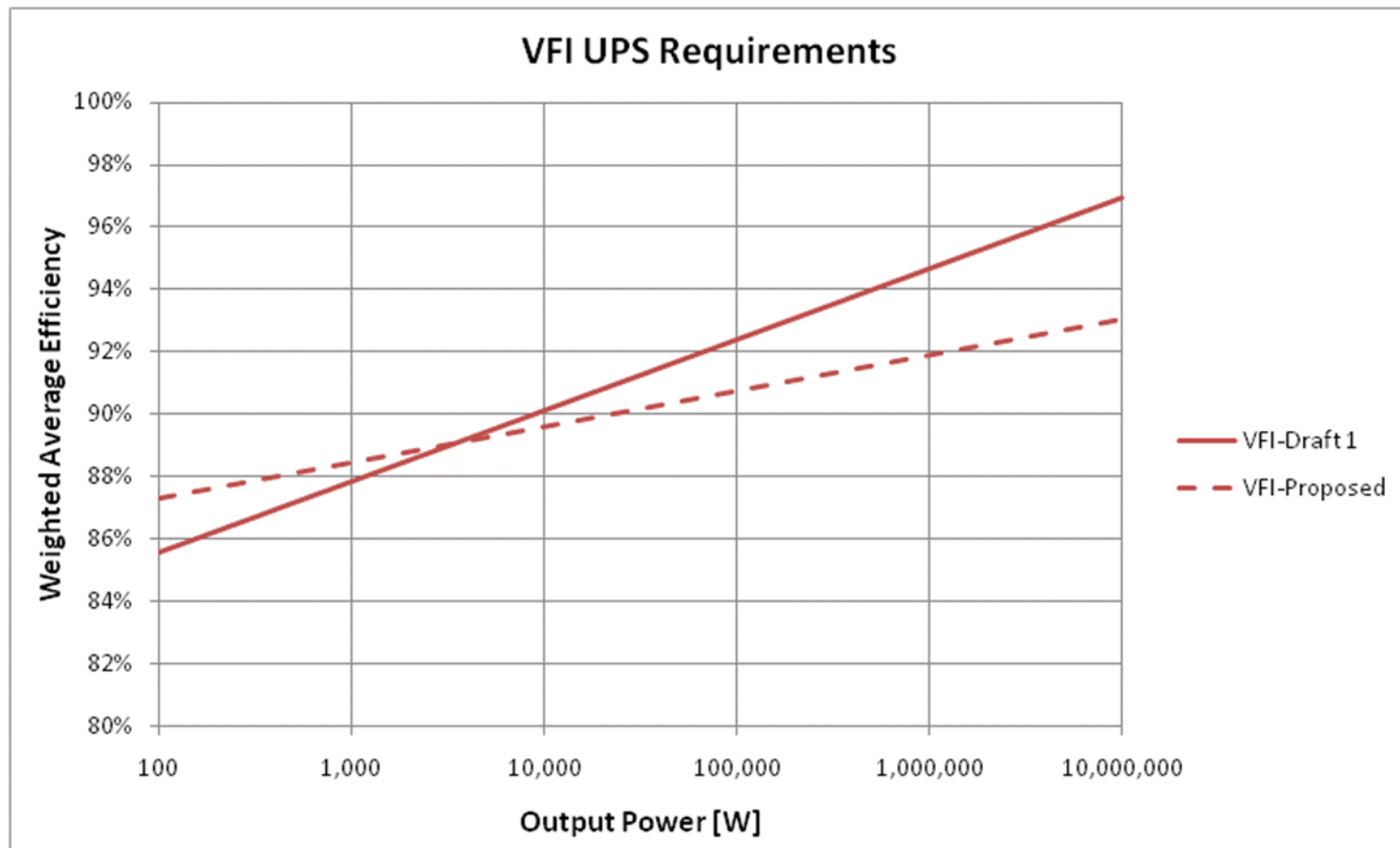
- Draft 1 requires 97% Weighted Efficiency
- Propose reduction to 96% Weighted Efficiency



VFI Proposal

Flatten slope; Use real power (P) not apparent power (S)

- Draft 1 formula: $0.0099 \cdot \ln(S) + 0.81$
- Proposed formula: $0.0050 \cdot \ln(P) + 0.85$



Multiple UPS Applications and Associated Load Profiles Need to be Recognized

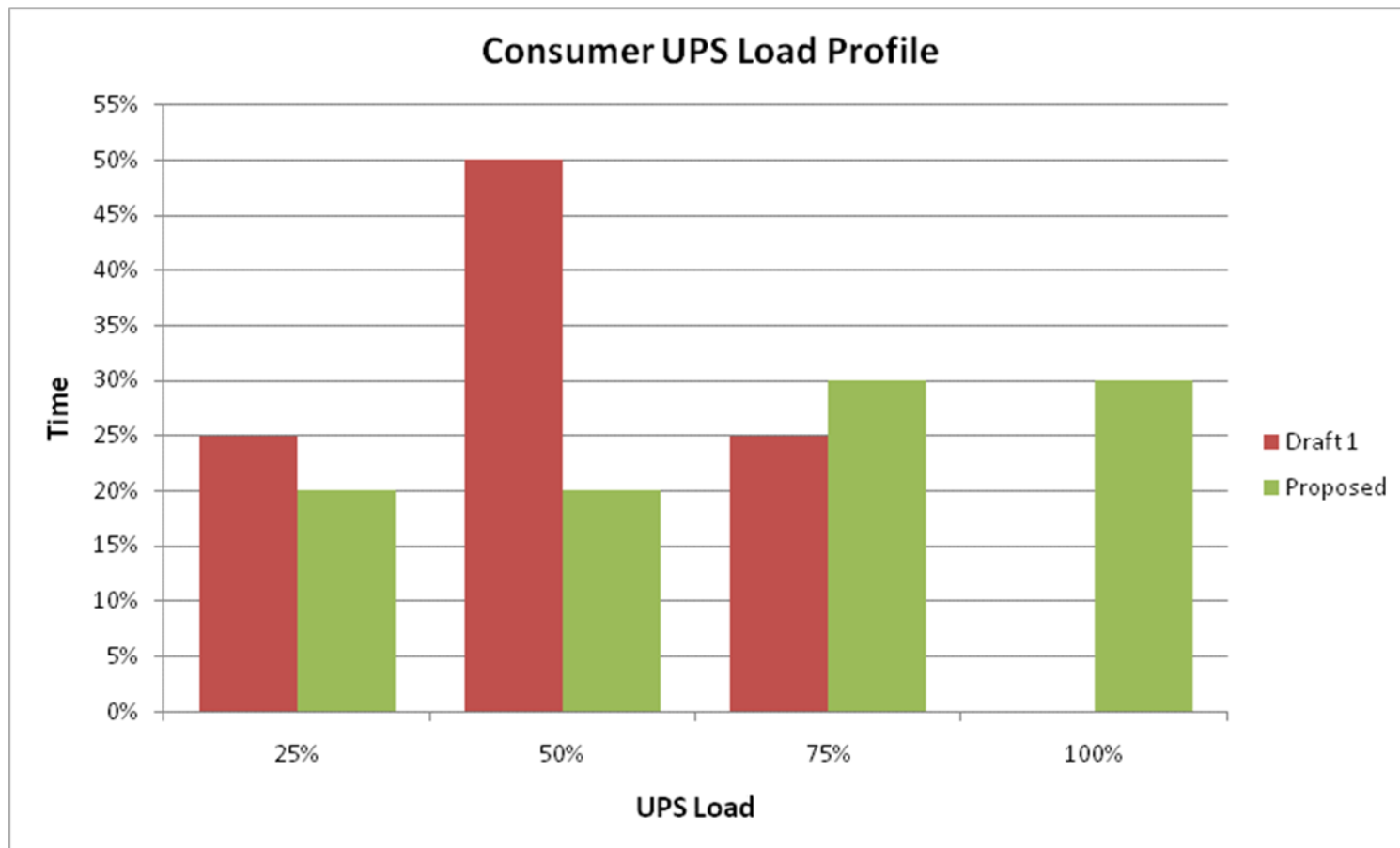
There are 3 primary UPS applications; each with a unique profile

- Consumer UPSs (also applies to AV UPS)
 - Lowest cost, ≤ 1.5 kVA, short runtime, single phase, VFD and VI
 - Some users shutdown/sleep load without turning off UPS – 25% important
 - Most users minimize UPS purchase price, and therefore UPS power rating, resulting in higher loading – 75 & 100% important
- Server UPSs
 - Medium cost, 0.5 kVA to 10kVA, longer runtime, single phase, VI and VFI
 - Loads never shutdown or asleep – 25% not important (2N extremely rare)
 - Most users heavily load to maximize circuit capacity – 50, 75 & 100% important
- Data Center UPSs
 - Highest cost, 10 kVA to >1 MVA, long runtime, three phase, VI and VFI
 - Loads never shutdown or asleep – 25% less important (2N is vast minority)
 - Mid range popular, heavy loading by some – 50, 75 & 100% important

Consumer UPS Load Profile Proposal

Both low and high low load scenarios common

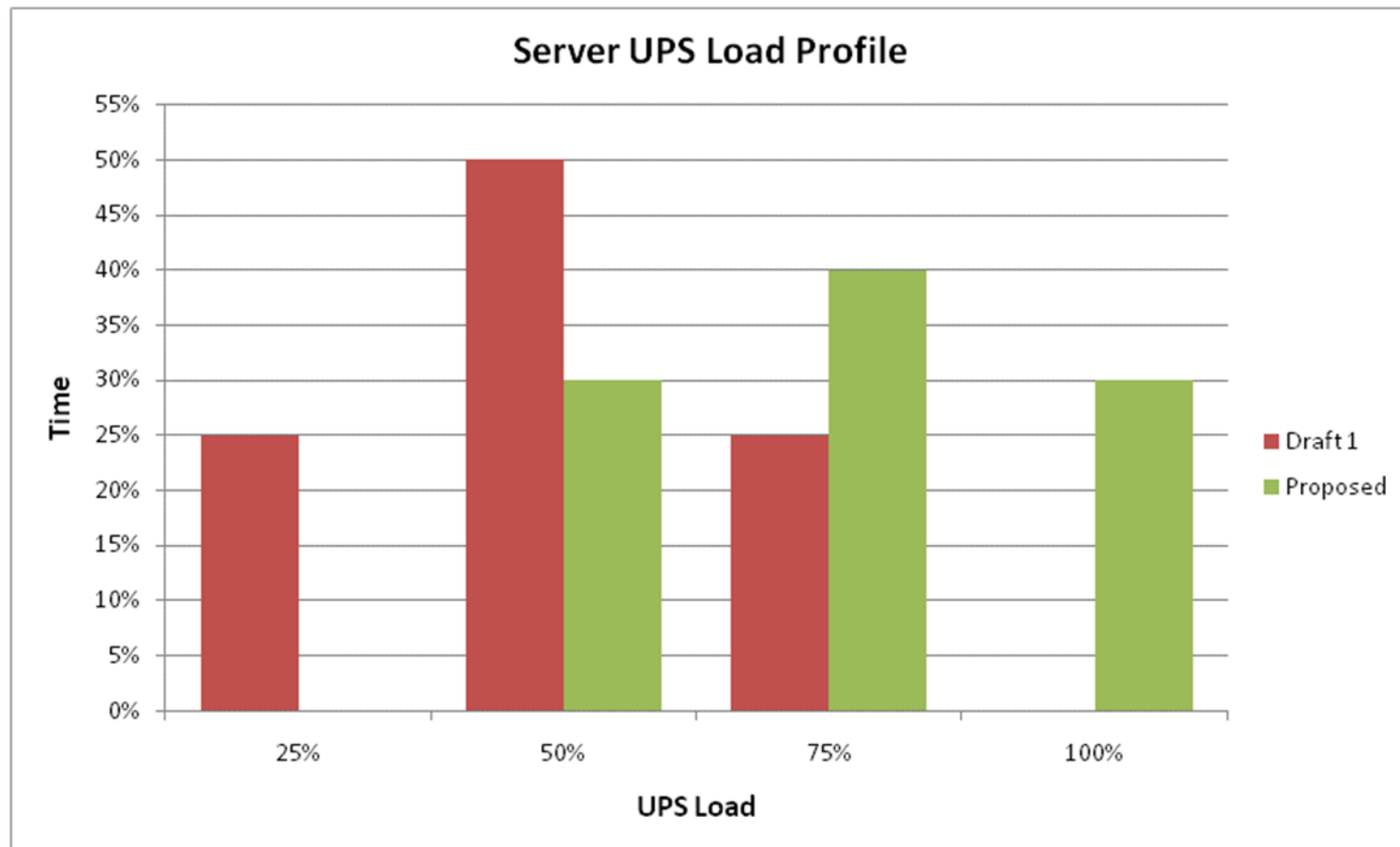
- Draft 1 uses: 25/50/25/0% weighting
- Propose change to: 20/20/30/30% weighting



Server UPS Load Profile Proposal

Heavy loading prevalent

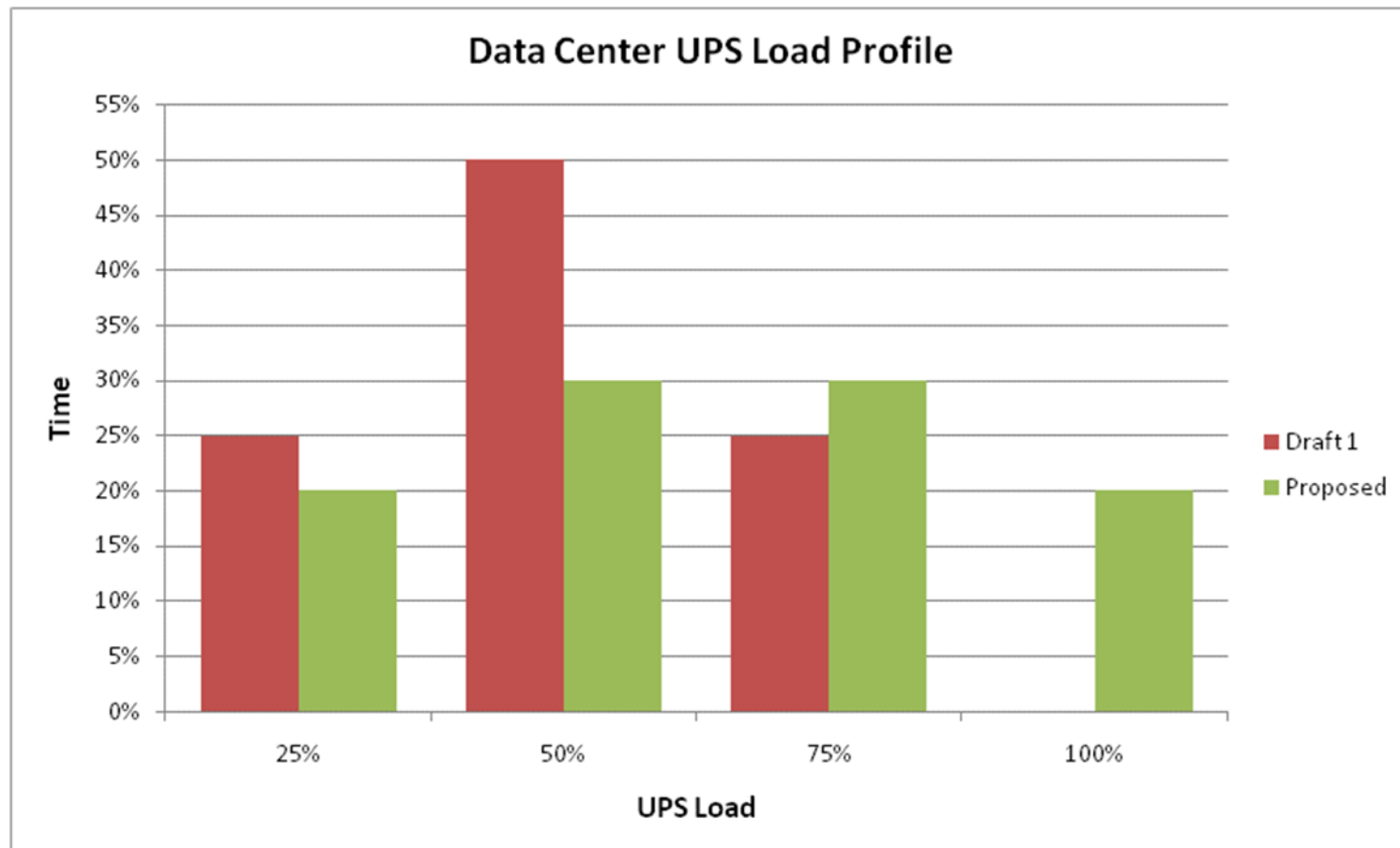
- Draft 1 uses: 25/50/25/0% weighting
- Propose change to: 0/30/40/30% weighting



Data Center UPS Load Profile Proposal

Most uniform load profile

- Draft 1 uses: 25/50/25/0% weighting
- Propose change to: 20/30/30/20% weighting



Multi-Mode UPS Testing and Reporting

- UPSs with multiple normal modes should not be allowed to qualify only in their most efficient normal mode as proposed in Draft 1
 - Experience shows that the vast majority of UPSs with multiple normal modes are operated exclusively in their most protective mode, so allowing products to qualify in a less protective mode will confuse consumers
- Alternatively, we suggest that all UPSs must qualify in their most protective normal mode and that all normal modes, their associated dynamic performance, and their corresponding efficiencies be declared on the PPDS
 - This will ensure that all UPSs capable of the same most protective mode will qualify in that mode, guaranteeing an easy and accurate comparison by customers
 - It also ensures that customers have the necessary data to make an informed decision regarding both the potential efficiency benefits and the risks associated with operation in these lesser protective modes

Potential Interaction with DOE Battery Charger Regulations

The efforts are separate and should remain that way!

- ENERGY STAR applies to all UPSs; DOE only regulates consumer UPSs
- ENERGY STAR applies to UPSs with all types of energy storage; DOE regulations only apply to UPSs with chemical batteries
- ENERGY STAR tests UPSs with their output on (as they are typically used); DOE tests UPSs with their output off
- ENERGY STAR uses the International Standard test procedure for UPSs (IEC 62040-3 Ed. 2); DOE uses a non-standard test procedure designed to test battery chargers
- ENERGY STAR has global reach; DOE regulations apply only in the USA
- ENERGY STAR is a voluntary program that recognizes the most efficient products; DOE regulations legally prevent low efficiency products from being sold

Thanks for your attention!

Backup Material

Draft 1 vs. Proposed Efficiency Summary

- Lower VFD and VI requirements by 1%
- Flatten slope for VFI
- Draft 1 would have required large VFI to be more efficient than VI and VFD!

