



Data Centers & Servers

Emerging Program Opportunities, Baseline & Measurement Approaches in Data Centers

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Ground Rules

- ▶ Interactive
- ▶ Flexible and focused
- ▶ Use of “parking lot”
- ▶ 100% Participation
- ▶ No such thing as a dumb question
- ▶ All perspectives are valid and valued
- ▶ Follow CEE committee conduct guidelines

Session Agenda

- ▶ Introductions, Agenda, Committee Context
- ▶ Presentations
- ▶ Discussion

Session Objectives

- ▶ To learn about promising energy efficiency measures in data centers, existing benchmarks and metrics
- ▶ To learn about, discuss emerging data center energy monitoring approaches and enabling technologies
- ▶ To catalogue current program experience, identify and prioritize data center program objectives and EM&V needs

Introductions

▶ Name

▶ Organization

▶ Data centers program status

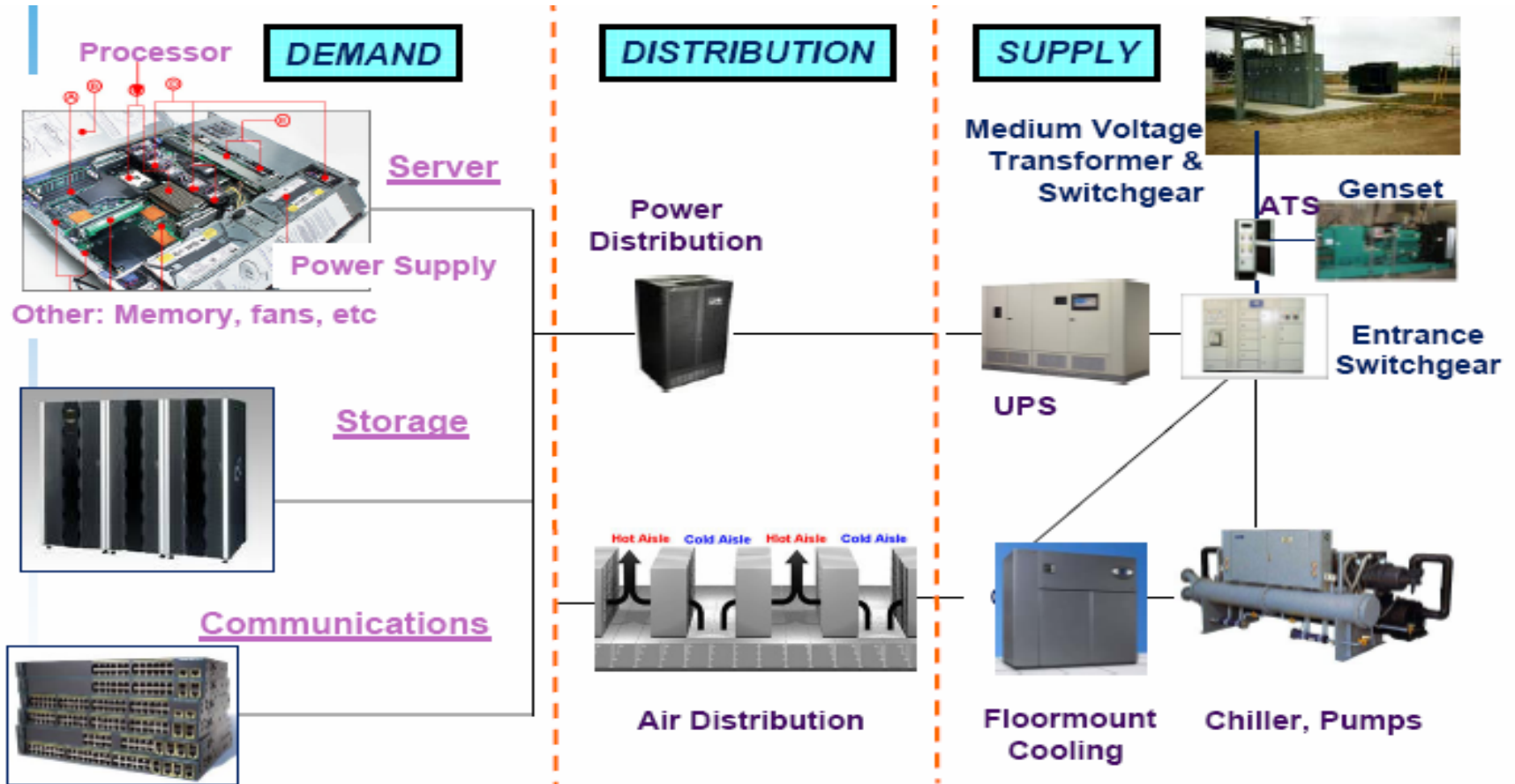
- We have a leading data center or IT program
- We have an established data center program
- We are supporting custom data center projects, considering a program
- Data centers are too hard!

Data Centers & Servers Context

IT: 30-50%

Cooling: 25-30%

Distribution: 25-30%



CEE Data Center Committee

1. Consensus-based definitions, performance specs	<p><u>Servers</u>: ENERGY STAR Tier 1 specification</p> <p><u>Other end uses</u>: E* storage exploration, maybe UPS</p> <p><u>Data center metrics</u>: DOE, EPA, The Green Grid endorse PUE, DCiE efficiency metric</p>
2. Collective understanding of opportunity, players, industry motivations	<p>Program info sharing; Industry, government agency engagement (DOE, EPA, TGG)</p>
3. Recommended common program strategies	<p>Draft program model – here today to further development!</p>

Presenters

▼ Dale Sartor

- Lead, LBNL Building Technologies Applications Team

▼ Ed Sanchez (by phone)

- Supervisor of Business Technology, Sacramento Municipal Utility Districts

Discussion Questions

- ▶ What are your data centers program priorities?
- ▶ What are the EM&V opportunities, challenges? Do some of the metrics, benchmarks or tools discussed map to these priorities?
- ▶ What are outstanding questions or information gaps?
- ▶ What information should be collected centrally to support members in addressing common EM&V needs?
- ▶ What partners (industry, government, other) could help further develop the EM&V approaches and inform common strategies, guidance or protocols?