

Technology Deployment Solutions

“The Data Center Continuum
& Potential Energy Efficiencies”



Agenda

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- 4 Review



About Us

TDS focuses on Data Center projects that encompass Corporate Real Estate, IT & Facilities, Process and Technologies

- Bridge Gaps for Datacenter design, construction & relocation management
- Cross Functional Domain Expertise
- Green Pilot Programs leveraging Existing Energy Reduction Dollars

Technology Deployment Solutions (TDS) is a founding member of the Green Data Center Alliance (GDCA) with 3,800+ members and growing



About GDCA

Global, nearly 50% end users, with open forums for discussion

The goal of the group is to be the central repository of information for myriad industries that design, build, operate and support data centers that wish to contain, control, and reduce power consumption inside the data center envelope.

Board is all End-Users and are functional experts in the five areas we divide the data center into.



Our Perspective

- Interacting with Fortune 200 firms discussing our Pilot and their internal efforts
- Market leaders have energy reduction programs
 - Airflow (CFD), physical, virtualization, consolidation
- Vendors & Technology are ahead of what the client is ready for or able to take advantage of (Containers, SaaS, Utility Computing, On/Off)
- NYSERDA - Aggressive in Data Center with programs paying 50% of engagements up to several million dollars
- With that kind of incentive why aren't more organizations taking advantage????



End User Mind Set (IT)

- Uptime drives their decisions
- Very risk averse
- Budget is shrinking
- Does not have the time, money, or personnel,
- *Does not have desire or motivation* to establish, monitor and track consumption/changes to his environment



Why low adoption of EE programs

- Do not want to spend money to get money
- Too many solutions without verifiable metrics
 - Disbelief/Skeptical of “radical” ROI based solutions
- Most physical assets will be replaced on a schedule
- Do not wish to highlight inefficiencies or change status quo
- Power is paid by someone else in the organization
- Probably don't know EE programs exist (NYSERDA)



Our Approach

We break the data center into 5 areas of concentration that *should* be considered with regards to consumption:

1. Design/Engineering
2. Real Estate/Facilities
3. IT
4. Finance
5. Governance

In every area mistakes are pervasive, even excellent organizations make and repeat, that have adverse effects on energy consumption



Energy Management Approaches

We view Energy Management as a continuum - The Starting Point is different for every company (GDCA currently developing)

- Take complexity and cost out of the 1st step (DCie or PUE)
 - CFD Modeling & Virtualization is not the starting point
- Incent simple, quick self assessments that are equally easy to verify
- Do not stop at the physical; process and financial responsibility tweaks can lead to far larger gains than any solution on the market
- Spread spend on Pilot Programs and tout success stories to potential organizations
- Incent simple, reproducible programs to increase success



Solution 1



Case of 24 is \$12.75 and would reduce energy costs in 80% of data centers by 10% (Masking Tape)

- Basic principals of airflow - plug holes in floor, spaces between servers
- Assist from Mechanical Engineer to adjust CRAC Unit set points higher
- CFD Modeling is unnecessary



Solution 1 – Example Results

14K Data Center of Financial Services Firm

- o Ten 20 Ton CRAC units set at 65 degrees
- o Serious problems with heat at the top of racks

Plugged holes under racks and between servers after \$100K in CFD modeling

Results -

Turned One CRAC Unit completely off

Raised set point from 65 to 71 degrees on all remaining CRACs
Easily 10% Reduction in overall costs of power

Did NOT need CFD to get similar results



Solution 2 - Purely Physical

- Cooling represents 50% of power costs
- Nearly 80% of data centers have cabling under floor
- This blocks 33% to 66% of airflow before it ever reaches the device
- Removing the obstruction slows the velocity of airflow and creates greater opportunities for hot and cold air segregation
- When combined with CFD and air “channeling” 20% reductions can be exceeded in overall consumption



Solution 3: Dynamic Server Allocation

- Nearly 60% of applications follow the workforce
 - Even if we broke the day into 12 hour shifts more than half of your applications do not require power 24X7
- It is also accepted that between 15–30% of applications either are flat or do not have an owner: “Orphaned”
- For every watt it takes to power a server you lose 2.84 watts
- If an organization knew what applications it had, and when they were in use it could identify these orphaned servers and kill them
- If they knew who they belonged to they could establish SLAs and turn them on/off based on business rules resulting in over 35% reduction in consumption of energy



TDS 60 Day Green DC Pilot Program

Show savings immediately, & create Road Map through Application Audit, and rating other areas against developing GDCA standard

- Application Audit - with existing tools or TDS pings servers (1st -30 days)
 - Work with IT to Kill, with BU to Kill but Verify (\$\$\$ back)
- Physical Audit - Real Estate/Facilities, Design & Engineering
 - Steps for Airflow improvements, Power distribution & Advanced Accessories
 - Limitations/Opportunities of Existing Space
- Operational/Organizational Assessment
 - Governance and Financial limitations/Opportunities



Review

- The Data Center is hyper–complex
- IT people are slow to change
- Adding Energy Efficiency to the mix is a big new variable
- Everyone is scrambling to show “Green” solutions and there is more hype than substance
- The technology is way ahead of the user’ s ability to capitalize on it
- Start now on the simple end of the continuum, reach out to NYSERDA, work with firms that view the data center broadly



Thank You!



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