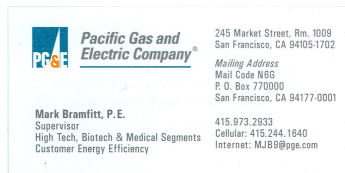


## Targeted Markets: Driving Innovation in High Tech



## The "Old" Paradigm

- Design and manage a series of programs, like deemed and calculated incentives, audits, demand response rates, etc.
- Did not drive innovation, and didn't "package" program offerings to meet customer needs.
- Example: energy audits that did not identify demand response strategies.



## New Strategy: Target Markets

- Assign teams of program managers and account representatives to focus on target markets (i.e. agriculture, hospitality, high tech, biotech, medical)
- Learn about these industries, and offer an **integrated portfolio** of program and service offerings to meet customer needs.

## Let's Look at High Tech

- PG&E serves the Silicon Valley – almost all of the industry heavyweights have a presence there.
- They mostly operate office space and some residual clean rooms.
- Mostly, they need help with **data centers** (turns out that this is across market segments).

## What is a Data Center...



In the "white room": A collection of computing equipment, mounted in racks, cooled by air, typically delivered from an under floor plenum. The equipment is served from a sophisticated power conditioning and delivery system that includes multiple sources of power.



Outside: Data centers have dedicated cooling systems, sometimes air-cooled DX units, but usually dedicated chilled water plants.

## ...In Northern CA

- Perhaps a total load of 400-500 mW.
- "Enterprise" centers known.
- "Corporate" centers hidden.
- "Closet" servers invisible.
- Key issue for Enterprise and some Corporate DCs: space, cooling, power.
- Situation so dire, that the industry is moving to...

## ...“Instant” DCs



## Where's The DC?



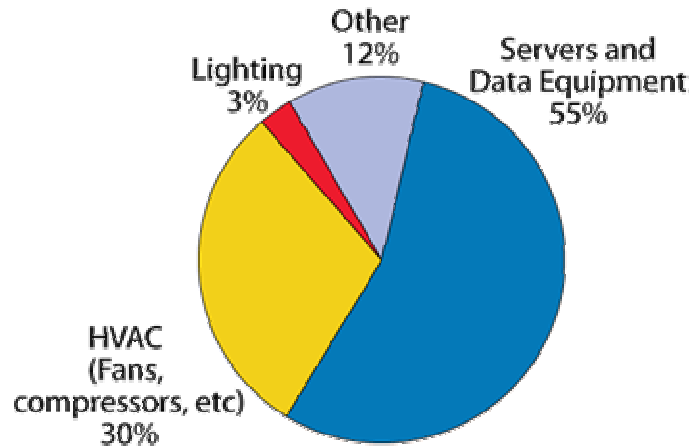
## Where's The DC?



## What PG&E Offered pre-2006

- Audits, incentives that addressed cooling systems only:
  - High-efficiency equipment (chillers, pumps, fans, etc.)
  - Air- and water-side economizers.
  - VFDs
- What we were missing:
  - Anything having to do with operations “inside the white room”.

## What We Were Missing



Energy use in a high-performance data center (LBNL/PG&E Study)

## More Importantly

- The Information Technology managers run the show at data centers, not facility managers.
- Programs and services that address cooling only address one aspect of the challenges facing these customers.

## New Initiatives in 2006

- Incentives for energy efficient computing equipment (R&R only).
- Incentives for virtualization/server consolidation.
- Incentives for airflow control systems.
- Third-party delivered program for airflow control.
- Incentives for high efficiency UPS and power distribution systems.
- Integrated, high quality, technical services.

## Coming in 2007

- Incentives for energy efficient computing equipment (new installations).
- RCx program for airflow.
- Integration of demand response into DC management!
- Incentives for conversion to liquid cooling.
- 80+ program for computing equipment.
- Increased focus on distributed systems: thin-client conversion, PC management.

## Results

- Industry agreement that a third to a half of data center energy use can be addressed through energy efficient strategies.
- PG&E doubles expected performance in this sector.
- PG&E (and HT industry) anxious to extend programs across US.
- Similar innovations occurring in other targeted markets – new programs, new approaches.

## More Information

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