



Server Virtualization and Consolidation

PG&E offers incentives and expertise that can help customers build a compelling business case for optimizing their IT infrastructure's energy usage.

Data Centers located throughout Pacific Gas and Electric Company's (PG&E's) service territory are facing capacity limits in their facilities.

Demand for "Computer Power," coupled with aging facility infrastructure, lack of physical space, power delivery capacity, or capability of cooling systems and equipment all present energy efficiency challenges to IT and data center facility managers.

Virtualization software technology is an effective solution to this challenge offering an opportunity to dramatically improve energy efficiency in data centers by increasing server utilization rates. Virtualization allows a single physical server to run multiple "virtual" servers, each with its own operating system and software.

By reducing the number of servers in operation, there is a reduction in the energy needed to power equipment, and a reduction in the energy needed to provide cooling to the facility where the equipment is housed.

PG&E INCENTIVES FOR SERVER VIRTUALIZATION

PG&E offers incentives and expertise that can help customers build a compelling business case for optimizing their IT infrastructure's energy usage. Based on an average annual energy use for a typical "volume" server, according to a report published by the United States Environmental Protection Agency, PG&E will pay \$200 per server removed as part of a consolidation project. ("Volume" servers typically feature one processing core and a 1U or 2U form factor, and are the predominate class of servers installed in most data centers.)

PG&E estimates that based on the annual direct energy savings for each server removed, customers will accrue annual cost savings of approximately \$300, depending on the rate schedule at the customer facility. Additional savings from reduced cooling loads in a data center are not reflected in this estimate, but PG&E's calculation model for consolidation will provide an estimate of this savings based on the type of cooling system serving the facility. For data centers fitted with air-cooled, direct expansion air conditioning equipment, cooling system energy savings can almost equal the direct energy savings from a consolidation project.

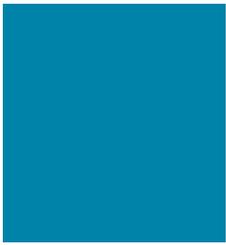
PG&E has supported customer projects with incentive payments where consolidation ratios have been as high as thirty to one, though lower ratios appear to be more typical. Projects have ranged from modest consolidations of a few dozen servers, to ones where hundreds of servers are consolidated in multiple project phases.

DATA CENTER AND IT ENERGY EFFICIENCY MEASURES

PG&E offers a broad portfolio of programs and services directed towards data centers and IT infrastructure, including financial incentive and rebate programs to pre-qualified customers through the Non Residential Retrofit and New Construction programs.

Customers who are considering construction of new data center facilities are encouraged to consult with PG&E for technical support and financial incentives for air conditioning and power conditioning and delivery systems that feature premium-efficiency equipment and designs.





For existing data centers, PG&E offers financial incentives for air conditioning and power delivery and conditioning upgrades, as well as incentives for a variety of IT equipment upgrades and technologies. PG&E also offers data center airflow management programs for both large and mid-sized facilities, enabling data center managers to drive improved airflow and lower operating costs.

PG&E also offers a portfolio of programs to support energy efficiency for computer workstations, including the purchase of efficient desktop computers and servers, premium-efficiency LCD monitors, PC network power management software installations, and conversion of workstations to thin client systems.

For more information about PG&E's program and service portfolio for data centers and IT infrastructure, visit www.pge.com/hightech, or ask your Service and Sales representative for a consultation. PG&E holds several data center and IT-specific training and education programs each year to help customers learn how optimizing their IT infrastructure's energy usage can improve the bottom line. Event information is available at www.pge.com/mybusiness/edusafety/training/pec/classes.



APPLICATION PROCESS AND ELIGIBILITY

All requirements and policies of the Non Residential Retrofit program must be followed in order to apply for and receive incentive funding, including, but not limited to:

- You must be a PG&E electric customer, paying the Public Goods Charge under the rate schedule for your account.
- Applications must be received and approved prior to project commencement.
- Customers must allow PG&E to inspect conditions both before and after the project, to verify that equipment is removed according to the application.

The Non Residential Retrofit program application form and guidelines are available at www.pge.com/mybusiness/rebates.

Please contact your **PG&E Service and Sales representative** for assistance in preparing your application. You may also request application assistance by calling our **Business Customer Service Center** at **1-800-468-4743**.



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