Hewlett Packard Enterprise

HPE Critical Facility Sustainability Trade-off Analysis Service

HPE Technology Consulting

The HPE Critical Facility Sustainability Trade-off Analysis Service focuses on parallel facility analyses to capture sustainability "opportunity cost" and assess its impact on reliability and operational sustainability. The service begins by establishing the facility baseline, using industry-accepted metrics and indices regarding sustainability, space, energy, emissions, and reliability.

Next, the service evaluates mid- and large-scale, capital-intensive projects in the context of reliability, space, capacity, emissions, and power and cooling issues facing the data center. A reasonable, balanced, financially feasible set of choices is much more likely to arise when all subjects are considered simultaneously, than it is when the same subjects are considered sequentially. This comprehensive view leads to the recognition of the opportunity cost—or cost-effectiveness—of an expensive initiative in one mode or one location, and its role in restricting the data center's ability to make progress across all issues.

Careful and thoughtful evaluations of data center design upgrade approaches result in a balance of improved efficiency and system reliability. Thus, a good data center consultant may evaluate both data center and business models to promote optimization of the data center design for your needs. The final result is varying levels of improved efficiency, and development of a final solution that is tailored to your business's competing goals regarding space, efficiency, emissions, reliability, first cost, operating cost, costs associated with risk, and total cost of ownership. Capital-intensive projects considered for the parallel analysis may include a variety of upgrades, such as additions or upgrades of UPS systems, chillers, or cooling units; free cooling systems; containment and air segregation strategies; geothermal heat pump or heat rejection systems; tri-generation /CCHP systems; fuel cell systems; and renewable energy solutions.

The HPE Critical Facility Sustainability Trade-off Analysis Service follows a four-phase process of data capture, data analysis, data reporting, and presentation of strategies and recommendations:

1. Planning and preparation. This phase starts with a planning conference call to discuss the project objectives; review your current building/facility environment and its mechanical and electrical infrastructure, Building Management System, and related documentation; discuss specific capital-intensive projects for feasibility parallel analysis; and identify members of your staff who will participate in this feasibility study. Based on the results of the conference call, HPE will create a feasibility study plan that specifies the approach, schedule, and any types of measurements that need to be collected from the data center facility, along with the instruments/devices required, frequency of measurements, details regarding data gathering, roles and responsibilities, and schedule of the site data-gathering activities.

2. Onsite and virtual interviews and data gathering. The HPE assessment team visits your site and works in conjunction with your facilities and/or operations staff to evaluate the physical space/constraints and to collect data including historical power use, building envelope details, building operating schedules, and operational characteristics. Any required specific power, temperature, pressure, and flow measurements are also collected.

3. Analysis, modeling and report writing. The HPE consulting team analyzes the information that is collected; models a specific set of site variables; and provides a written report of parallel feasibility analyses highlighting the facility's proposed energy efficiency metrics/intensities, reliability/availability metrics, carbon footprint, and water footprint. The report will also provide a conceptual layout of solutions and financial metrics for implementing those projects.

4. Presentation. A conference call or in-person meeting is arranged to share the results of the parallel modeling and analysis of the project, including strategies and recommendations. At the completion of the engagement, you will receive a copy of the documented report.

Service benefits

This service:

- Provides an engineering evaluation of capital-intensive sustainability projects that addresses impact on both efficiency and reliability, using analyses based on holistic understanding of critical spaces using proprietary tools and methods developed specifically for this purpose
- Calculates the combined energy savings, carbon reduction, water savings, and operational cost savings from implementing the solution(s)
- Determines the tangible efficiency metrics of your facility, both pre and post solution(s), including energy and carbon efficiency metrics, energy utilization index (EUI), Power Usage Effectiveness, Carbon Usage Effectiveness, and Water Usage Effectiveness
- Determines tangible reliability/availability metrics of your facility, pre and post solution(s)
- Provides a conceptual diagram and layout of the proposed solution, along with physical connections and interfaces within the overall mechanical and electrical infrastructure
- Provides a list of any available utility incentives and federal or state tax credits that can be leveraged when implementing the solution(s), along with a calculation of their amounts
- Provides financial analyses of the proposed solution, including capital cost, operational cost savings, return on investment (ROI), net present value (NPV), internal rate of return (IRR), and simple payback (SPB)

Service feature highlights

- Service planning
- Feasibility study preparation
- Feasibility study plan
- Data collection
- Presentation of findings

Table 1. Service features

Feature	Delivery specifications
Service planning	An HPE service specialist will plan all the necessary activities, including the identification of any prerequisites, and schedule the delivery of the service at a time mutually agreed upon by HPE and the Customer, which shall be during local HPE standard business hours excluding HPE holidays, unless otherwise agreed by HPE. Any service provided outside of HPE standard business hours may be subject to additional charges.
Feasibility study preparation	HPE and the Customer will conduct an assessment planning conference call to prepare for the assessment. During the conference call, HPE and the Customer will:

- Review and discuss the project objectives and methodologies
- Determine project team members, roles and responsibilities, and anticipated time commitments required of the Customer's staff
- Review the plan, schedule, and requirements for data collection
- Discuss the documentation that the Customer will provide to HPE prior to conducting the assessment, including
  - Facility floor plans indicating layout of electrical power distribution, cooling equipment, and space type
  - Electrical system drawings, including lighting systems
  - Mechanical system drawings
  - Utility bill history, fuel delivery, purchased chilled water/hot water/steam (for prior 12 months)
  - Available electrical equipment schedules and any manufacturer's data relevant to the Customer's equipment

Feasibility study plan

Based on the results of the preparatory conference call and an analysis of the drawings and specifications provided by the Customer, HPE will create a feasibility study plan for the proposed solution(s). The plan will:

- Identify equipment requiring electrical monitoring or other site-specific measurements
- Specify responsibilities associated with the installation of measurement or data-gathering devices
- Outline expected time commitment from the Customer's staff
- Detail the schedule for onsite data-gathering activities and define the level of support that HPE will require from Customer personnel

HPE will email the feasibility study plan to the Customer for review.

Data collection

Prior to commencing data collection, HPE and the Customer will review the feasibility study to verify that the plan and project milestones are complete.

HPE and the Customer will conduct an evaluation and any required equipment measurement and data collection at the Customer's facility. HPE will furnish the data-gathering devices and provide direction and recommendations to the Customer on placement of the devices to obtain the desired data. The Customer will be responsible for installation and removal of the data-gathering devices. Measurements will be conducted to:

- Determine the power consumption and performance data of electrical or mechanical systems identified in the assessment plan, such as:
  - Air-handling equipment
  - Chillers
  - Condensing units
  - Dry coolers
  - Cooling towers
  - Pumps
  - UPS systems, transformers, and lighting system
  - Boilers
- Obtain any pertinent space and envelope data, such as construction of roof and walls, window specifications, space type and use, and others

In addition, HPE will:

- Interview the Customer's designated facilities and operations personnel to gain an understanding of the Customer's operational processes and anecdotal operating history
- Gather any additional relevant data not obtained during the feasibility study planning process, such as operating history and site operations, maintenance, fuel records, and building schedule

Presentation of findings

HPE will provide the Customer with a report detailing the findings of its analysis, and will conduct a conference call up to four hours in duration to present and review these results with the Customer. The report will consist of the following as appropriate:

- Management summary/Introduction
- Description of proposed sustainability project(s)
- Baseline energy, emissions, and water "current conditions" cost and reliability modeling analysis and results
- Proposed energy, emissions, and water solution(s) cost and reliability modeling analysis and results
- Industry-accepted efficiency metrics of the Customer facility pre and post solution(s), including energy and carbon efficiency metrics, EUI, PUE, CUE, and WUE
- Industry-accepted reliability/availability metrics of the Customer facility pre and post solution(s)
- Conceptual diagram and layout of proposed solution and physical connections and interfaces within the overall mechanical and electrical infrastructure
- List of any available utility incentives and federal or state tax credits that can be leveraged when implementing the solution(s), along with calculation of their amounts
- Provides financial analyses of the proposed solution, including capital cost, operational cost savings, return on investment (ROI), net present value (NPV), internal rate of return (IRR), and simple payback (SPB)
- Recommendation of strategies

Service limitations

- This service is limited to the provision of feasibility analysis of building's proposed solution(s) and does not include any remedial activity. Any corrective measures to implement the recommendations identified by this service are the responsibility of the Customer.
- Any services not clearly specified in this document or in an associated Statement of Work are excluded from this service.

Customer responsibilities

- Contact a Hewlett Packard Enterprise service specialist within 90 days of date of purchase to schedule the delivery of the service
- Assign a designated person from the Customer's staff who, on behalf of the Customer, will grant all approvals, provide information, and otherwise be available to assist Hewlett Packard Enterprise in facilitating the delivery of this service
- Provide a suitable work area for delivery of the service, including access to an outside telephone line, power, and any network connections required
- Allow Hewlett Packard Enterprise full and unrestricted access to all locations where the service is to be performed
- Complete and return any custom questionnaires or checklists within five days of receipt, if applicable
- Prior to the assessment planning workshop, provide to HPE all pertinent site, electrical, and mechanical drawings; utility bills; and any other site-specific infrastructure data requested by HPE
- As applicable, assist HPE in identifying manufacturers and model numbers of facilities equipment analyzed as part of this service
- Be responsible for installation and placement of data-gathering devices
- Ensure that properly trained personnel and proper safety equipment are available to support placement of data-gathering devices
- Take reasonable precautions and implement all safety-related procedures reasonably requested by HPE
- Adhere to licensing terms and conditions regarding the use of any Hewlett Packard Enterprise service tools used to facilitate the delivery of this service, if applicable

General provisions/Other exclusions

- Hewlett Packard Enterprise's ability to deliver this service is dependent upon the Customer's full and timely cooperation with HPE, as well as the accuracy and completeness of any information and data the Customer provides to HPE.
- Hewlett Packard Enterprise reserves the right to charge, on a time and materials basis, for any additional work over and above the service package pricing that may result from work required to address service prerequisites or other requirements that are not met by the Customer.
- Hewlett Packard Enterprise reserves the right to re-price this service if the Customer does not schedule and provide for subsequent delivery within 90 days of purchase.

This document describes services which may, in certain countries or jurisdictions, be considered professional engineering services. If licensed engineering services are described herein or in a future change order, they are offered and will only be provided by professional, licensed engineers. In the United States, these services are generally offered by EYP Mission Critical Facilities, Inc., ("EYP MCF") which is a wholly owned subsidiary of Hewlett Packard Enterprise, and all engineering services will be performed by EYP MCF or its subcontractors pursuant to a SOW signed by the Customer and EYP MCF.

For more information

For more information about Hewlett Packard Enterprise support services, contact any of our worldwide sales offices or visit the following website:

www.hpe.com/services/support

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