POWER ANALYTICS™

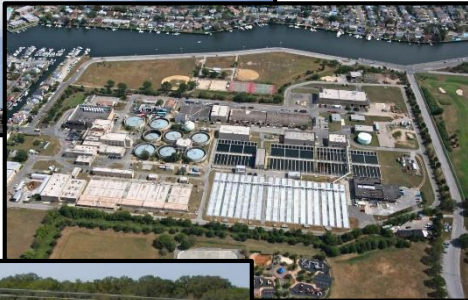# Power Engineering Professional Services

We give you the power to be self-reliant

Military

Water Treatment and Other Vital Infrastructure

Community Emergency Facilities

Electric Transport … and much more

Economic Analysis
- Capital Project Cost
- Market Participation
- Intrinsic Benefits

Due Diligence
- Energy Alignment Plan
- Interconnection Facilitation
- Feasibility Study

Design
- Power Modeling
- AC/DC Grid Integration
- Real-Time Arc Flash Study
- Use-Case Scenario Analysis
- Evaluation of Critical Infrastructure

Facilitation of Build/Own Partnering
- Multi-Stakeholder Collaboration
- Federal and State Regulators
- Community Engagement

Operations and Maintenance
- Certified System Operators
- Energy Management Systems
- Maintenance
- Security and Reporting

Market Interaction
- Dispatch and Control
- Outage Coordination
- Meter Data Submission

We Design, Build, Own, Operate, and Maintain Individual and/or Aggregated Microgrids and DER Assets and Facilitate Participation in Energy Markets

GSA

Raleigh, NC   San Diego, CA   Charleston, SC   Washington, D.C.   Houston, TX
Nationwide Toll-Free 800-362-0603   www.poweranalytics.com

Comprehensive Power Engineering
Professional Services from Design
through Market Interaction

We Create the Foundation
For Reliable, Resilient Power
For the Nation's
Most Critical Facilities

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Comprehensive Professional Power Engineering Services

Energy Alignment Plan™ – *Initial go/no go decision point*

The foundation of any power system project is an initial Energy Alignment Plan. This plan considers the power needs of the client, the existing and surrounding power equipment, and what additional power equipment should be added to produce an optimal power solution for the target location. A base-case model of the projected power system is built on the computer, using Power Analytics Paladin® DesignBase™ modeling software (see page 2). This model is then run against a variety of operational scenarios to evaluate multiple configurations of equipment—traditional and renewable generation, energy storage, demand response and energy efficiency options. Each scenario considers a variety of parameters that could impact the performance and cost of the power system. The scenarios are then ranked in order of preference by our power engineers to facilitate the client's final selection of the pro forma, optimal power system (microgrid) configuration.

Feasibility Study – *In-depth go/no go decision point, design is ready to build*

The next step in the Power Analytics process is an in-depth feasibility study of the proposed power system. This study thoroughly examines all operational and financial factors to predict the true feasibility of the project. By incorporating client-supplied data, through our state-of-the-art PAC Edge™ software, our power engineers consider multiple factors to "right size" the power system. These factors may include: best blend of least-cost generation options, interconnection with the local utility, performance under emergency conditions, anticipated growth of demand, and ability to sell excess power into the surrounding energy markets. This study results in a clear, comprehensive view of the economic and operational details of the proposed power system.

PAC Edge™ - *Your site specific information is incorporated into the model*

What makes the Power Analytics modeling process so effective is our ability to incorporate pertinent information from the client, in any format, directly into the system modeling process. This data includes items unique to a client's site, such as: weather patterns, electric one-line diagrams, purchase power agreements, power demand, etc. This data allows us to simultaneously run scenarios of both the power model and the financial model in order to optimize system performance and overall project economics. This software ties the power model and the economic model to the client's daily operations, once the system is fully commissioned. PAC Edge is the ultimate power system customization tool.

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Paladin® DesignBase™ *- Model building design tool*

Complex power systems require modeling to ensure optimization. The Power Analytics Paladin DesignBase software is used by our engineers to create a base-line power model on the computer during the initial Energy Alignment Plan and to refine this model during the Feasibility Study. DesignBase creates the power model (technically called a one-line diagram) using a virtual *"warehouse"* of power system equipment from a wide variety of vendors. This power model is then further perfected through scenario analysis, using the client-supplied, site-specific data gathered with the PAC Edge software (see page 1) and the Microgrid Power Management System (discussed below). Scenario analysis allows our engineers to run the model through multiple critical situations to see how it will perform and to derive the optimal equipment configuration to achieve the client's overall performance and economic goals.

Microgrid Power Management System™ (MPMS) *– System optimization tool*

The MPMS software is used to both discover the optimal system configuration during the model building stage and to operate the power system in real time after it has been constructed and commissioned. MPMS takes an eagle's eye view of what is happening on the microgrid system and the point of common coupling with the local utility. Every few seconds, MPMS gathers the status of the entire system—encompassing all potential variables that could impact performance and cost. Then, by instantaneously iterating configuration options against the ideal power system model (as developed by DesignBase and PAC Edge), MPMS determines the optimal configuration for that moment and directs all power system elements to assume that configuration. Moment-by-moment, MPMS optimizes both the performance and the economics of the power system.

Paladin Real-Time Arc Flash™ (RTAF) *– Safety tool*

The Real-Time Arc Flash™ software enables organizations to make up-to-date assessments of changing threats as they emerge. RTAF maintains an uninterrupted, 360 degree view of the facility and its potential arc flash hazards, continually checking all components, equipment, and systems. It provides detailed, updated advisories for site personnel regarding the appropriate safety procedures and protective gear recommended to work in a given vicinity, and makes intelligent recommendations about where potential arc flash hazards could emerge and gauges their potential severity. RTAF is based upon IEEE 1584 and NFPA 70E standards, and is the only such software of its kind.

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Build and Ownership Options – *Facilitated through our corporate partners*

Power Analytics has multiple, highly experienced, corporate partners who will finance, build, and own your power system from our custom design. This *Microgrid-as-a-Service* option provides you with all the benefits of an independent power system, while off-loading investment and operational risk.

Power Analytics Generation Services – *Daily operations and asset management*

Power Analytics provides energy management services for commercial and industrial customers who own microgrids or Distributed Energy Resources (DER)—distributed generation, combined heat and power (CHP), renewables, energy storage, fuel cells; and/or are demand response (DR) curtailment providers. With these services, Power Analytics offers DER owners comprehensive, real-time operational management to support market integration. Our products and services for deregulated markets include, but are not limited to: installation, monitoring, control, compliance, risk management, analysis, reporting, economic dispatch of distributed energy capacity and load curtailment. These services enable DER owners to profitably manage and maintain their energy assets, while enhancing emergency-outage preparedness for their footprint.

NERC Certified System Operators and Control Center Services – *Balancing, coordination and communication, situational awareness, and monitoring*

Power Analytics has a primary (and backup) control center in Houston, Texas that is staffed at all times with NERC Certified Reliability Coordinators. This entity is called Gridforce Energy Management™, LLC., and is a subsidiary of Power Analytics. The Gridforce system operators provide balancing or transmission operator services for assets nationwide from one of the most audit-accredited control centers in the country. Gridforce has certified over 40 Balancing Authority areas and transmission operators across the U.S. and oversees 10,000MW of generation.

For more information or to request a demonstration, contact
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Transactive and Customer Engagement Platform

EnergyNet® - *Transactive and customer engagement platform*

EnergyNet is a patented, comprehensive, turn-key software platform designed for three purposes: optimizing the operations of the integrated grid; settling the financial transactions created by new and existing market participants; and, providing energy consumers, suppliers, and equipment vendors with sophisticated, easy-to-use, Internet-based tools for advanced awareness of energy usage, options, and opportunities.

For distribution utilities, EnergyNet offers a platform for the seamless integration of distributed energy resources. It creates cost savings through a more timely and efficient transaction settlement process. It provides an online "energy store" full of options and opportunities targeted toward specific market segments. And, finally, it improves distribution utility customer satisfaction and retention through enhanced consumer engagement.

For grid-edge consumers of all sizes, EnergyNet offers access to customized energy information about usage, pricing, options, and opportunities. It offers recommendations from the distribution utility, or other vendors, for energy savings, equipment purchases, financing, and payment options. It enables a quick and easy payment process for distributed energy resource owners who can supply energy and/or capacity to the utility or, if aggregated with other suppliers, to the regional system operator. And, finally, it provides a localized, off-grid, energy marketplace where grid-edge power suppliers can sell power directly to grid-edge power consumers, through community microgrids, solar PV, energy storage, etc.

EnergyNet is the premier transactive energy platform because it can deliver real-time, two-way actionable communications to and from all energy market participants and every interconnected grid element.

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