Z·GLOBAL
ENGINEERING & ENERGY SOLUTIONS

ZGLOBAL, INC.

COMPANY PROFILE

www.zglobal.biz

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WHO WE ARE

We are a team of professionals with over 100 years of combined "real experience" in managing and operating within large utility electric systems and the wholesale electricity market. With comprehensive knowledge and an innovative approach, ZGlobal Inc. can effectively tackle a variety of multifaceted management and engineering challenges. We have a proven track record in successfully integrating, organizing, and operating complex multi-million dollar energy facilities and systems across the Western United States.

WHAT WE DO

Based on our unique ability to balance engineering principles with current financial realities, ZGlobal Inc. provides integrated "big picture" solutions to complicated business concerns. Our focus is upon helping our clients gain a complete understanding of their market to more effectively adapt and compete in the complex electricity sector. Our mission is to unlock the value of our client's assets to meet their professional objectives.

WHO WE SERVE

Our clients range widely from vertically integrated utilities, public power agencies, de-regulated utilities, independent system operators, renewable energy providers, state regulators, power producers, industrial and commercial customers to independent financial institutions, brokers, marketers, hedge fund managers and bankers. ZGlobal's diverse abilities rest not only within our qualified team but, more importantly, in the minds, hearts, and actions of the people we serve.

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EXECUTIVE SUMMARY

Formed in February, 2005 by Ziad Alaywan, ZGlobal Inc. offers integrated services that assist our clients in making well-informed decisions to meet their business needs. Assembling a strong team of professionals with a wide range of experiences in the energy sector, ZGlobal Inc. has created an ideal combination of individuals who have worked extensively in developing the electricity market at the California ISO and within various roles of organizational leadership throughout the last decade. ZGlobal Inc. specifically has experience in Western energy infrastructure development, grid planning and operations, scheduling, bidding, market operations, settlements, market design and market auctions. The qualified team at ZGlobal Inc. has successfully managed large Market Systems with multiple venders under even the most extreme time constraints.

Experienced personnel

ZGlobal Inc. has assembled a unique team of professionals who each have at least 15 years of industry related experience.

Approach

Our goal is to work with our client's personnel to generate the best possible solutions for their specific needs and business requirements. We strive to listen to and fully understand our client's goals and then work in cooperation with resident experts to create a plan that meets or exceeds our client's expectations and delivers a superior end product at a reasonable cost. We believe that this collaborative approach is the most effective way to ensure that a project team's skills are fully leveraged to discover the best possible answer in addressing our client's business needs. Knowledge of the discovered business solution is then shaped and reinforced within the client's organization.

Cost-effective delivery

Clients understandably desire the best possible value for their investments. The team of experts at ZGlobal Inc. strives to provide services that offer that value. Working alongside the individuals we serve allows us to join in defining clear objectives, plotting a road map to achieve those objectives, and providing the means necessary to support our client's in reaching their destination. Effectively utilizing our team of experienced professionals at ZGlobal Inc. allows us to minimize the costly overhead associated with seeking out additional individuals who may then have to be "brought up to speed" before contributing to the team's success in helping our clients accomplish their goals.

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Development flexibility

ZGlobal Inc. is routinely involved in large projects that rely heavily on the creative input and significant contributions of our various team members to develop solutions that best meet the needs of every stakeholder. While it may be difficult to negotiate this complex task, it is crucial when problem solving and implementing change among systems that are so tightly joined with one another, often leaving little, if any, room for error. Consideration and understanding of these more large-scale issues affords us the opportunity to determine and help implement optimal solutions.

Promise to deliver

ZGlobal Inc. has a proven track record of completing projects on time with results that are unmatched in the energy industry. We have been involved in several complex high-profile missions with extremely tight timelines and consistently delivered, as promised, at or below projected cost. ZGlobal's team accomplishes this by determining clearly defined project objectives and milestones at the start and then continually updating the team with regular status reports. This not only keeps the client's management informed of our progress, but it also serves to keep the entire team focused upon our ultimate objective: to punctually deliver a high-quality product at an excellent value.

THE ZGLOBAL INC. TEAM

ZGlobal Inc. is uniquely positioned in that its core team members led the start-up of the California Independent System Operator (CAISO). Members of our team have managed large-scale, complex projects under extreme pressures and have extensive experience in successfully designing, testing, and delivering CAISO market and grid systems within a restrictive twelve-month timeframe. Individuals on our staff have held various key positions at the CAISO, Pacific Gas and Electric (PG&E), Public Utility Commissions (PUC), California Energy Commission (CEC), Southern California Edison (SCE), Western Electric Coordinator Council (WECC), and the California Department of Water and Power (CDWR). Specific examples of the positions previously held at the CAISO, FERC, and CPUC by the current team members at ZGlobal Inc. include:

- CAISO Market Re-design and Technology Upgrade (MRTU) Project Manager
- CAISO Managing Director of Engineering and Operations
- Leader of the CAISO Start-up as Director of Market Operations and Director of Operational Systems
- CAISO Manager of Real Time Operations & Manager of Settlements Systems
- CAISO Regulatory Attorney
- FERC Attorney, FERC Office of the General Counsel, Markets, Tariffs & Rates Division
- Economic advisor to the CPUC President
- Gubernatorial appointee on energy policy and economics

Table 1: ZGlobal Inc. Team Experience

Members of the ZGlobal Inc. team have experience, dating back to the mid 70's, in operating the California electric transmission grid and the CAISO market in addition to working for PG&E, SCE, and WAPA. Our collection of expertise can be grouped into three major disciplines, as summarized in Table 1 below:

Electricity Markets & Analytics	**Grid Infrastructure** (TRANSMISSION & GENERATIONS)	**Project Implementation**
CAISO & ERCOT Tariff Electricity Market Design	Transmission & Generation Economic Analysis	Risk Management
Locational Marginal Pricing Modeling & Forecasting	Transmission Planning & Modeling	Strategy Deployment
Strategic Planning & Regulatory Support	Load Forecasting	Verify Settlements Charges
Ancillary Services Market	NERC / WECC Reliability Standard	Market Performance
Congestion Revenue Right (CRR)	Perform System Impact Study Power Flow & Stability Analysis	Renewable Portfolio Assessment
Real Time Market Operations	Renewable & Greenhouse Gas Standards	Process Modeling for Portfolio Management & Forecasting
Day Ahead Energy Market & Forecasting Energy Prices	Large Generator Interconnection Policy & Implementation	Vendor Management
Wholesale Settlements & Transaction Evaluation	Control Area & Real Time Grid Operations & Energy Management System (EMS)	Develop Functional Requirement
Scheduling & Bidding into CAISO & ERCOT Markets	Integrated Resource Planning	Develop Test Scenarios & Evaluate "Bid to Bill" Performance
PUC Resource Adequacy Requirement	Compliance Monitoring	Market Trial Support
Capacity Market	Generation Operations & Dispatch	Market Readiness & Integration

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Table 2: ZGlobal Inc. Team Breakdown

Name	Title
Ziad Alaywan, P.E.	**Principal**
Steve Auradou	**Sr. Associate - Operations**
Christine Vangelatos	**Sr. Associate - Settlements**
Brian Rahman, P.E.	**Sr. Associate - Engineering**
Tom Breckon	**Specialist - Information Technology**
Chuck Wu	**Specialist – System Planning**
Dr. Mingxia Zhang	**Specialist – Economics Analysis**
Gary Brown, P.E	**Sr. Associate – Energy Development**
Masoud Shafa, P.E.	**Sr. Market Design**
Bruce Centurino	**Sr. Transmission Engineer**
Brian Rothstein	**Sr. Settlements Associate**
Jenny Mueller	**Transmission Engineer**

DETAILED CONSULTING SERVICES

The purpose of this document is to provide detailed information about the various services we offer at ZGlobal Inc. Our comprehensive approach involves issues of analysis, market design, transmission, generation, load, and implementation. With an overall "big picture" focus; the team at ZGlobal Inc. brings a suite of expertise that can be grouped into three major disciplines:

- Electricity Markets Analytics
- Grid Infrastructure Development – Transmission, Generation, and Renewable Energy
- Project Implementation

Electricity Markets Analytics

Specifying the delivery point of energy under MRTU is critical as it impacts several aspects of your business and influences efforts to optimize your assets. Utility companies are facing greater regulatory oversight, record fuel prices, higher operating costs, overseas competition, and incentives for renewable energy. Below is a brief description of the delivery risks associated with MRTU and the services ZGlobal Inc. can offer to minimize these risks while helping you prepare to more effectively compete in the complex electricity sector.

Daily Business Support

ZGlobal Inc. provides daily on and off site technical advice, supporting your staff on the Real Time, Hour Ahead, and Day Ahead energy markets in California. Assistance includes Real Time supplemental energy, utilization of adjustment bids, wheeling, linking congestion and curtailment priorities, and ancillary services imports. We also provide a technical review of the impact of various components of settlements charges and their financial and operational effects.

Delivery Risks

Under the new California and Texas Modal Markets, the delivery risks associated with energy require comprehensive assessment. For instance, under CAISO MRTU, ownership of Point to Point (PTP) Congestion Revenue Rights (CRRs) entitles the holder to be paid the difference in the congestion components of the locational prices between the specific point or points of receipt and the specified point or points of injection. PTPs are directional and may be defined either as obligations or options.

PTP obligation holders will be entitled to receive payments based upon the difference in the congestion components of the locational prices when those differences are positive, and will be obligated to make payments when the locational differences are negative. It should be noted that when the difference in locational prices is negative, a transmission customer is paid for scheduling transmission between the points specified in the PTP. Therefore, there is no net cost for scheduling transmission services matching the PTP held by the transmission user, regardless of whether the difference in locational prices is positive or negative. PTP option holders will be entitled to receive payments based upon the difference in the congestion components of the locational prices when those differences are positive, but will not be obligated to make payments when the locational differences are negative.

PTP CRRs that are defined as obligations are essential in maximizing efficient use of the grid. In essence, an obligation means that the holder may either have to pay the marginal cost of re-dispatch or provide the re-dispatch itself, in which case it will be paid the difference in locational prices. In either situation, the counter-flow schedules associated with the obligation rights function to relieve constraints within the system and allow other schedules to flow in the opposite direction. A system that offers at least some rights in the form of obligations will therefore expand access to the grid, allowing more transmission rights to be allocated and additional schedules to flow.

As new business rules change the way energy contracts and transactions are scheduled, traded, and settled, the role of uplift charges, marginal losses, and other charges becomes increasingly important. In many cases, these changes in the energy sector will have significant financial impact and likely require significant adjustments in today's business practices. To mitigate these potential impacts, ZGlobal Inc. can provide business rule definitions, explanations, settlement examples, and crucial information in other areas of specific interest as needed to support our clients. Issues of concern may include topics such as:

- Bid Mitigation – When, why, and how mitigation occurs. Bid adder rules.
- Bidding Rules – Validations, RA Resources, Ancillary Services (A/S), restrictions to changes.
- Market Power Mitigations – Full assessment of various CAISO Day Ahead mitigation rules and how these rules work.

- Self Scheduling – Market treatment, opportunity for change schedules and settlements implications.

- Trades – Physical and financial trades. Explain the rules of trade, how to schedule, and how the money flows.

- Congestion Revenue Rights (CRR) – Transmission allocations, CRR auctions, transmission risk, and how to alleviate congestion and marginal loss risks.

- Reliability Unit Commitment (RUC) – Bidding requirements and allocation of costs.

- Resource Adequacy and Local Capacity Requirements – Explain the various components and integration of Reliability Must Run, the Reliability Service Capacity Tariff (RSCT) under the FERC Must Offer, Resource Adequacy, and Local Capacity Requirement.

ZGlobal Inc. provides assistance in better understanding the risks and rules impacting business in the energy market. We explain business rules and settlement practices and supply references to relevant CAISO and ERCOT Tariff and Business Practice Manual sections. Additionally, we report on CAISO and ERCOT market and infrastructure development, tariff filings, and major WECC, ERCOT, and PUC activities. Through an assortment or reliable methods, we impart current and pertinent knowledge that gives our clients a valuable advantage in the field.

Asset Valuation and Financing

A required responsibility within every successful business is asset valuation. Gas prices, market changes, and regulatory uncertainty place added pressure and importance on achieving the bottom line for both existing and planned assets within the electricity sector.

Critical tasks associated with asset valuation include the assessment of market dynamics, regulatory risks, discount rates, options, profitability measures, and transaction costs. Adequate execution of these tasks requires a sophisticated understanding of electric transmission planning and operation, engineering, and finance with in-depth knowledge of the energy industry.

With a unique combination of experience in market and grid analysis, forecasting, and commodity pricing, the ZGlobal Inc. team is well positioned to

evaluate existing assets and operations of businesses participating in the California and Texas markets.

Strategic Planning

Globalization, deregulation, and competition are three essential trends in which ZGlobal Inc. staff share a multitude of experience. Often times, unprepared companies react to change and associated risk with avoidance in an effort to buffer themselves against the unknown. However, greater success may come from a more proactive and open-minded attitude. ZGlobal Inc. works with your team to develop and refine your business model and regulatory strategies, become more familiar with new product markets and processes, and better face the stressors associated with changes and business trends while flourishing in the industry.

Regulatory Support

ZGlobal Inc. provides a monthly report summarizing various market developments, tariff filings, and activities in the West, including frequency of congestion, location, system configuration, impact of outages on congestion, and seasonal energy flow patterns. We prepare periodic technical examination of key design and policy changes that have material impact on your "bottom line." We advise your management personnel of specific regulatory and business assessment subjects associated with future market developments of California, ERCOT, the Pacific Northwest, Southwest and Province of Alberta. This sort of information can assist your organization in better positioning itself for success in several related markets.

The Federal Energy Act of 2005 emphasized the role of the Federal Government in the reliability of the nation's electric transmission grid. This Act placed mandatory reliability standards on utilities, grid operators, and suppliers. Members of the ZGlobal Inc. team are certified to ensure that our client's personnel are adequately trained, thorough processes are in place, and documentation is sufficient to support compliance with the mandatory reliability standards.

Regulatory risks connected to potential changes in the law can negatively impact investments and existing assets. Utilities, suppliers of electricity, marketers, and brokers have to comply with a multiplicity of regulations and standards from many different entities, such as:

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- Federal Energy Regulatory Commission (FERC)
- Northern Electric Reliability Corporations (NERC)
- Public Utility Commissioner (PUC)
- California Independent System Operator (CAISO)
- Electric Reliability Council of Texas (ERCOT)
- Western Electric Coordinated Council (WECC)

ZGlobal's familiarity and practical experience with these regulatory policies put us in a unique position to assist you in better managing and complying with the full range of regulations present in today's business environment while concurrently working to help ensure an effective balance between existing market risks and your business objections.

Transmission and Generation Economic Analysis

ZGlobal's technical expertise in the areas of calculation of LMP prices for energy, transmission losses, and congestion is central to the services we provide. ZGlobal Inc. has developed *GridSelect*™ [1], an essential tool used to perform economic analysis that can accurately estimate the financial impact of MRTU on your operations. *GridSelect*™ employs the same optimization software utilized by CAISO and applies a similar methodology while modeling all major transmission constraints to produce multiple year calculations of LMP prices at each node. With the use of *GridSelect*™, ZGlobal Inc. is able to model CAISO transmission constraints when calculating potential congestion cost and marginal losses at each bus while hydro output, gas prices, load and generation patterns, outages, and bidding patterns are concurrently varied. This type of intelligence is critical in planning ahead and assessing the magnitude and type of risk your organization could be exposed to. For support in planning your successful future, ZGlobal Inc. offers the following:

[1] ZGlobal Inc. Inc. has developed a tool that models all transmission systems within the CAISO, replicates the transmission constraints and various operating procedures, and uses a commercial optimization engine (PLEXOS) to calculate LMP prices at all nodes while simultaneously varying hydro output, gas prices, load and generation pattern, outages, and bidding patterns. *GridSelect*™ is also able to take the LMP, decompose prices, and calculate E-z Gen Hub prices and Load Aggregation Points (LAP) for each hour. *GridSelect*™ calculates congestion, marginal cost, and various transaction costs for multiple points of injection and withdrawal.

- In depth analysis using analytical methodologies to better estimate your asset opportunities based on LMP prices and provide comprehensive information about vital issues relating to the LMP variations.

- Quantified financial and operational impacts associated with accurately projected exposure of CAISO MRTU and the Texas Nodal Market on your organization's current and future operational strategies.

- Correct settlements forecasting based on the charge codes and type for various transaction fees.

Example of Economic Analysis:

Consumer Benefit, Producer Benefit, and Transmission Owner Benefit

In a two-zone model, Zone 1 and Zone 2 are connected by a transmission line with capacity. Suppose we plan to expand the line limit to $T + \Delta T$ and would like to measure the benefit resulting from this expansion. The line may still be congested even after expansion. With the transmission expansion, it is likely that generators in Zone 1 will produce less output and generators in Zone 2 will produce more output than they would without expansion. It is also likely that the price in Zone 1 will be lower and the price in Zone 2 will be higher when compared to the non-expansion case.

In order to quantify the impact of transmission expansion on welfare, the following needs to be done:

- Compute all welfare measurements (i.e., all surpluses) for cases with and without expansion.

- Subtract surplus without expansion from surplus with expansion.

- Obtain the net impact of transmission expansion on surpluses.

We call the change in surpluses, caused by a transmission expansion, the "transmission benefit." Figure 1 shows how consumers and producers in each

zone are benefited or harmed by a transmission upgrade in this two-zone example.

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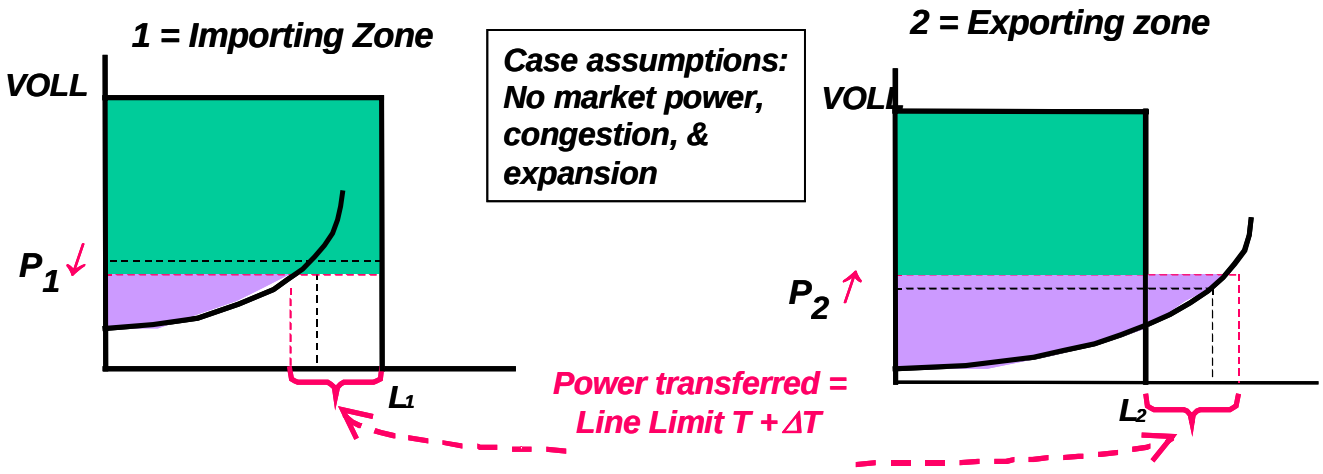
Figure 1: Transmission Upgrade Benefit in the Two-Zone Example



If the amount of power transferred from Zone 2 to Zone 1 is increased, then consumers in Zone 1 may benefit from a lower price and consumers in Zone 2 may be harmed by a higher price.

$$\Delta CS_1 = -\Delta P_1 * L_1 > 0$$

$$\Delta CS_2 = -\Delta P_2 * L_2 < 0$$

However, producers in Zone 1 are harmed as a result of having less of their output dispatched and from receiving a lower price for their dispatch. On the other hand, producers in Zone 2 benefit from expansion due to having more of their output dispatched and from receiving a higher price for their dispatch.

$$\Delta PS_1 = \Delta PR_1 - \Delta PC_1 < 0$$

$$\Delta PS_2 = \Delta PR_2 - \Delta PC_1 > 0$$

Transmission owners (or CRR holders) of the line may or may not benefit from expansion depending how much the flow is increased and how much the price difference is changed.

$$\Delta CR = CR_w - CR_{w/o} = (\Delta P_1 - \Delta P_2) * T + \Delta T * (P_{1w} - P_{2w})$$

If the line is no longer congested with expansion, Transmission owners (or CRR Holders) may have a net loss.

The method of calculating consumer benefit, producer benefit, and congestion revenue benefit can be generalized from the simple two-zone model and applied to the complicated California network. One way to check the validity of the partitioning of total benefits among different market participants is to check whether the following identity holds at the system level:

$$\mathbf{SB = -\Delta PC = \Delta CS + \Delta PS + \Delta CR}$$

Therefore, the first step in benefit evaluation of any transmission or generation project is to make sure the total societal benefit calculated can be correctly disaggregated into three major components: consumer benefit, producer benefit, and transmission owner (or CRR holder) benefit. If the project's total societal benefit exceeds its total project cost, the project is beneficial to society as a whole. However, such a project may not benefit everybody as some market participants will benefit while others may not. Thus it is important to further examine the distributional impacts of a transmission project on the various market entities. The project developer will evaluate the client's benefits and costs and decide whether or not the project would be of benefit.

Wholesale Energy Settlements and Transaction Evaluation

Every participant in the energy industry, whether they are one who buys or sells, must settle their energy transactions. A settlement statement should contain the charge or payment information for a market participant. The ZGlobal Inc. team is skilled and qualified in analyzing a range of charges, performing shadow settlements, and tracing errors within the following:

- Grid Management charges
- Wheeling, Imports, Exports, and Market Uplifts
- Congestion, Transmission Losses, and Congestion Revenue Right (CRR)
- Energy, Ancillary Service, Capacity, Reliability Services, and Trades

- Imbalance Energy
- Allocation Methodology

GridSelect™ Capabilities

The GridSelect™ tool is intended for use by market participants to perform an economic analysis that estimates projected transaction costs of the MRTU design for their planned operations. This financial intelligence is critical for entities in planning ahead and assessing the magnitude and types of risk they may be exposed to while operating within the Nodal Market. As a sample, the information provided by GridSelect™ can be used to perform the following studies and analysis:

- Estimate market participant exposures to LMPs and provide more comprehensive information on the various aspects surrounding those exposures.
- Develop strategies for CRR allocation and auction.
- Forecast electricity costs to ratepayers.
- Quantify financial and operational exposure of the Nodal Market on current and future operations.

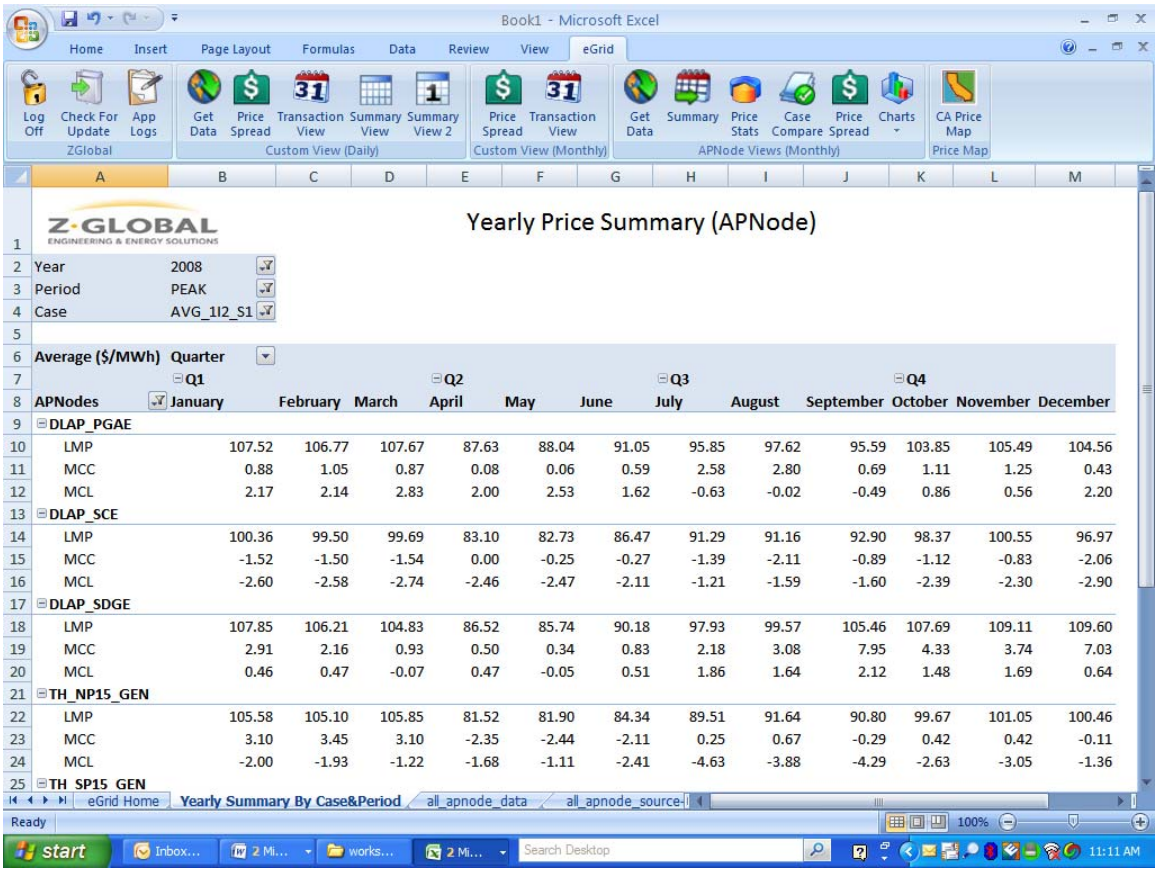
The GridSelect™ tool is capable of performing the below listed modeling features:

- Integrated Optimal Power Flow (OPF) and Generator Unit Commitment
- Simulation of entire WECC Network
- Explicit modeling of contracted power and generation terms and provisions
- Extensive Generator Unit Commitment parameters

- Hydro and Pumped Storage optimization
- Forced and Maintenance outage optimization
- Emissions parameters and calculations
- Combined Energy and Ancillary services optimization
- Contract specificity
- Capacity and Generation
- Endogenous New Generation entry
- Nodal and Zonal depiction and calculation
- Generation Nomograms
- Conversion of industry standard load flow data formats (e.g. PTI, PSLF)

By using GridSelect™, ZGlobal Inc. has the ability to evaluate all of your existing contracts and any future contracts or investments, calculate the energy, congestion, marginal losses and CAISO transaction costs, estimate the resource adequacy and capacity value of these assets, and quantify your potential transaction costs. GridSelect™ can therefore produce the following outputs:

- Point to Point transactions
- Point to Hub and Hub to Point transactions
- Hub to Hub transactions
- Individual and total cost for each transaction
- Hourly, seasonally, yearly, and multi-year calculations



Yearly Price Summary (APNode)

Year	2008											
Period	PEAK											
Case	AVG_1I2_S1											
Average ($/MWh)	Quarter	Q1			Q2			Q3			Q4	
APNodes	January	February	March	April	May	June	July	August	September	October	November	December
DLAP_PGAE												
LMP	107.52	106.77	107.67	87.63	88.04	91.05	95.85	97.62	95.59	103.85	105.49	104.56
MCC	0.88	1.05	0.87	0.08	0.06	0.59	2.58	2.80	0.69	1.11	1.25	0.43
MCL	2.17	2.14	2.83	2.00	2.53	1.62	-0.63	-0.02	-0.49	0.86	0.56	2.20
DLAP_SCE												
LMP	100.36	99.50	99.69	83.10	82.73	86.47	91.29	91.16	92.90	98.37	100.55	96.97
MCC	-1.52	-1.50	-1.54	0.00	-0.25	-0.27	-1.39	-2.11	-0.89	-1.12	-0.83	-2.06
MCL	-2.60	-2.58	-2.74	-2.46	-2.47	-2.11	-1.21	-1.59	-1.60	-2.39	-2.30	-2.90
DLAP_SDGE												
LMP	107.85	106.21	104.83	86.52	85.74	90.18	97.93	99.57	105.46	107.69	109.11	109.60
MCC	2.91	2.16	0.93	0.50	0.34	0.83	2.18	3.08	7.95	4.33	3.74	7.03
MCL	0.46	0.47	-0.07	0.47	-0.05	0.51	1.86	1.64	2.12	1.48	1.69	0.64
TH_NP15_GEN												
LMP	105.58	105.10	105.85	81.52	81.90	84.34	89.51	91.64	90.80	99.67	101.05	100.46
MCC	3.10	3.45	3.10	-2.35	-2.44	-2.11	0.25	0.67	-0.29	0.42	0.42	-0.11
MCL	-2.00	-1.93	-1.22	-1.68	-1.11	-2.41	-4.63	-3.88	-4.29	-2.63	-3.05	-1.36
TH_SP15_GEN												

- CRR obligation exposure
- Value of CRR Options and CRR Obligations
- Locational value of generation and transmission
- Value of participating Load and Demand Response
- Calculation of CAISO and ERCOT market uplift charges per transaction

Grid Infrastructure Development – Transmission, Generation, and Renewable Energy
Infrastructure development, market rules, and commercial/contractual agreements share a complex linkage and must therefore be appropriately integrated to ensure effective planning and success with your business objectives. ZGlobal Inc. is exceptionally familiar the Western and California electric grids and understands the impact of various factors such as flow patterns, transmission bottlenecks, load pockets, and constraint areas. Accordingly, ZGlobal Inc. is able to carry out and present:

- Management of large generation Interconnection processes in accordance with the FERC Large Generator Interconnection Process (LGIP).
- System impact studies, including power flow and stability analysis.
- Transmission modeling and sensitivity analysis.
- Analyses of the reliability and economic impact of generation addition, re-powering, and transmission upgrades.
- Compliance audits to ensure that NERC mandatory reliability rules are in place.
- Reviews of the performance of Real Time automatic generation control and the various Energy Management System (EMS) functions.

Key Steps in Project Development

Perform Initial Feasibility Assessment and Secure Start up financing

- Identify the need for the project
- Identify location, fuel supply, and technology
- Perform high level economic assessment
- Developers need certainty.

Risk and Return

- Financial instruments (bond, hedge bond, etc.)
- Risk aversion
- Capital structure
- Regulatory risk

Project Evaluation

- Cost of capital
- Payback analysis
- Market impact
- Average return on book value
- Internal rate of return (IRR)

Project Feasibility

- Contact Utilities / Marketers
- Perform full economic analysis
- Determine business model (energy, capacity, ancillary services, congestion, etc.)
- Prepare responses to RFO's
- Perform various studies (impact, interconnection, etc.)
- Contract negotiation
- Request approval for regulatory bodies

Establish a full cost estimate

- Land purchase
- Capital and operating cost
- Credits
- Start up cost
- Sign long term contract

Secure Financing

Start Implementation

- Complete engineering studies
- Issue an RFP
- Select the vendor

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NERC Training Experience Overview

Three members of the ZGlobal Inc. team are WECC and NERC certified professionals. The entire team has extraordinary experience in training augmented by a wide range of knowledge and skills as summarized herein. Past experience has involved several aspects of training facilitation within various organizations and has included design of simulators, preparation of training programs, coordination and instruction of training, and introductory supervision with instruction and preparation of new personnel. ZGlobal Inc. team members have lead training coordination for initial training of operations personnel at CDWR, coordinated training for PG&E at the start of the operator training program, established the WSCC (WECC) training program, established the PG&E simulator training for dispatch personnel, provided training services through consulting for new programs, and served as instructors for UCSB engineering school extension in areas of hydraulics and hydroelectric power.

Our training team is highly skilled not only in training development and delivery methods, but also in real-time operations, maintenance, and control.

Renewable and Greenhouse Gas Standards

Current California law and policies require California utilities and other electricity retailers purchase 20% of their electricity from renewable sources deliverable to the CAISO control area by 2010. Recently, the California PUC approved its December 13, 2006 Proposed Decision (PD) adopting interim Greenhouse Gas (GHG) Emissions Performance Standards (EPS) for new long-term financial commitments to base load generation by all Load Serving Entities (LSEs). The provisional EPS was promulgated in compliance with SB 1368 and serves as a bridge until an enforceable load-based GHG is adopted. The established interim EPS imposes a standard of 1100 pounds of CO2 per megawatt hour and applies to new ownership investments in base load generation facilities that would extend the life of the facility for 5 years or more, or generation procurement contracts of 5 years or more.

ZGlobal Inc. offers a collection of valuable services that aim to quantify the impacts of these policies on current and planned infrastructure development, energy prices, and portfolio management.

Compliance

Compliance with the various regulatory requirements can be a burden on your company. We believe that the regulatory requirements can and should be streamlined to better the overall effectiveness of the corporation. As an independent third party with the required expertise, ZGlobal Inc. can provide

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assistance to increase the likelihood that regulatory compliance risks are managed effectively and efficiently within your business.

Project Implementation

Delays in planning can result in costly stop-gap measures, inefficient utilization of expensive resources, missed opportunities, and potential revenue losses when the redesigned market opens. To mitigate these types of problems, ZGlobal's assessment will provide an evaluation of your current systems, processes, and people, assess any potential gaps, risks, and opportunities, and present findings and suggestions for the next action step. Upon completion of a thorough readiness assessment and gap analysis, we will be able to identify any business processes that require improvement or change, the training necessary to prepare personnel for MRTU, and the systems in need of upgrades or modifications. This process allows us to begin to formulate a strategy with our clients that will ensure efficient use of their valuable resources in preparation for MRTU.

Assessment and Analysis

Activities for the readiness assessment and gap analysis include the following tasks:

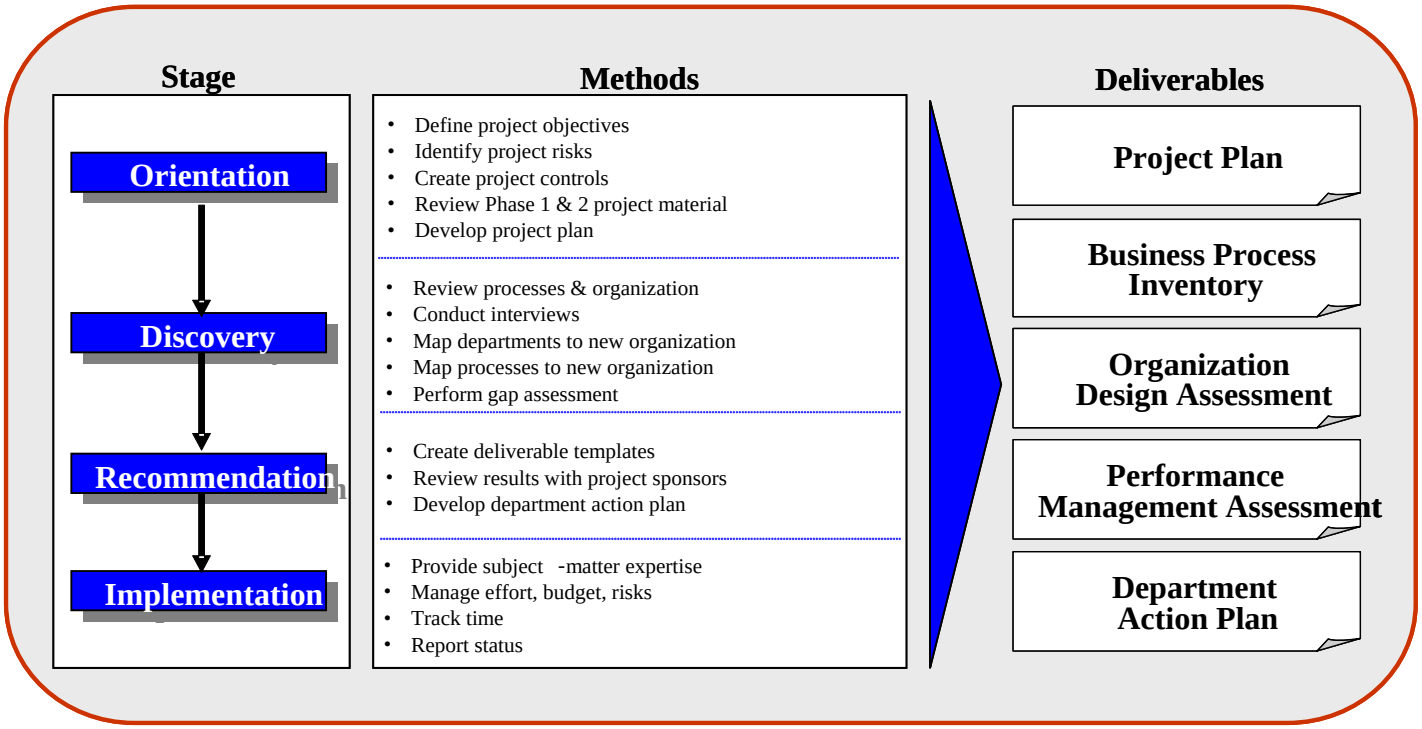
- Evaluate current systems, which systems can be leveraged, which systems need to be upgraded or replaced to support MRTU
- Identify new systems necessary to support the nodal markets in California and Texas
- Prioritize system requirements (critical vs. low/later priority)
- Evaluate integration requirements and custom development requirements
- Evaluate current vendor readiness
- Conduct high-level evaluation and cost estimates of IT readiness
- Produce advanced timelines of what it will take to get systems ready
- Front, back, and mid office review of ways in which current processes will be impacted by MRTU
- Assess training needs at different levels throughout the organization: front, mid, back office, management, IT resources, etc.

- Assess staff requirements
- Assess in-house knowledge of LMP markets and learn how to best leverage and augment this knowledge
- Assess organizational readiness

Project Management

Our team of professionals has extensive experience in project management. They have contributed to many "large scope" projects, including CAISO start-up, operational dry-run, ancillary services market re-design, real time market economic dispatch, SMUD/WAPA control area formation, and numerous network model updates and change-outs. During our tenure at the CAISO, the members of our core team were the front-line leaders of most of the large projects undertaken by the organization over the last 7+ years. We headed the entire project design; identifying scope, outlining key milestones and deliverables, fronting project development, tracking project progress and risks, conducting unit testing, organizing system testing and integration efforts, facilitating project implementation and roll-out, providing on-going RT support, and directing variance identification and resolution efforts. The ZGlobal Inc. team has gained indispensable knowledge performing these distinct tasks and utilizes proficiency in the discipline to help our clients plan for the future.

As earlier illustrated, the ZGlobal Inc. team of professionals has what it takes to lead, manage, and deliver successful projects with high visibility and numerous stakeholders. ZGlobal Inc. continues to attract leaders in the fields of market operations, energy system design and maintenance, utility operation, and energy policy. Our team members are regularly called upon to deliver high quality vital projects in a short period of time with demonstrated success.



Differentiators

Although relatively new to the consulting business, ZGlobal Inc. has built a strong reputation for excellence, reliability, integrity, and cost-effectiveness. We have assembled a team of professionals with expertise in plant and transmission operations, system and market operations, asset management, and project management that allows us to efficiently and effectively analyze our client's needs. It is through our many years of "hands-on" experience as highly trained staff that we have been successful in providing such quality services, setting us apart from our competitors in the energy consulting and engineering services industry.

Sample Completed Energy Projects

- Evaluated 500 mw polling agreement in SP15 and 300 mw in NP15.

- Prepared a business case, technical evaluation, and response to new generation requests for several California and Arizona recent RFO's.
- Analyzed scheduling and bidding strategies and performance for a fleet of 4000 mw in California and the Southwest.
- Tested and determined root cause of volatile real time dispatch for large thermal units in California.
- Performed detailed analysis of the impact of California's newly proposed Nodal Market to a large Load Service Entity (LSE) and several public power agencies.
- Led negotiations of Power Purchases Agreements (PPA's) for an investor group wanting to build two Biomass units in California and sell their output to a LSE.
- Assisted in describing the use of transmission hedge instruments as financial / physical rights.
- Performed a locational marginal pricing analysis for long term deal pricing in energy capacity for major energy trading corporations with large generation fleets in California, Arizona, and Texas.
- Worked with major independent power producers with over 4,000 mw of gas-fired resources in California and Arizona with connections to re-power major power plants.
- Conducted several identification through optimization of source and sink portfolios to obtain long-term transmission rights.
- Provided an analysis to hedge transmission congestion and structured a physical contract for a major Texas energy trading company.
- Represented five Western control areas at FERC Technical conferences and proceedings including providing numerous testimonies on topics related to the application of nodal energy pricing in California.
- Evaluated the market structure in the province of Alberta, Canada.

Training

ZGlobal Inc. provides training to energy traders and other staff working in the field of transmission system operations and physical constraints, current bidding and scheduling of energy, and ancillary service markets in forward and real time markets of the Western states and Texas.

ZGlobal Inc. offers customized training on the CAISO and ERCOT markets in the following areas:

Overview on CAISO & ERCOT Nodal Market

- Objectives of the nodal market
- Key differences in market rules between existing zonal and new nodal markets
- Understanding market instruments
- Understanding the difference between full-network and commercial models
- Reviewing Day-Ahead workflow
- Understanding Day-Ahead and Unit Commitment scheduling
- Reviewing Real-Time Workflow for CAISO & ERCOT Market Participants
- How does the Two-Step Settlement work?
- Why use Virtual Bids and Offers?
- Key Objectives in Structuring Optimal CRR Portfolio
- Bid-to-Bill Timeline & Challenges
- Key Deployment Milestones for the New ERCOT and California Market
- Using Full Network Model to compute Nodal Locational

Marginal Prices

- Key Differences between Zonal & Nodal LMPs

- How are LMPs computed?
- Understanding LMP Components
- Impacts of Flowgates on Congestion
- How can we explain negative LMPs?
- Understanding shift factors
- Sample Bid-to-Bill Calculations
- Methodologies to forecast Day-Ahead LMPs

Formulating Bidding and scheduling for Units

- Understanding bid parameters for units
- Computing Day-Ahead & Real-Time Settlement for units
- Bilateral scheduling
- Computing penalties due to Uninstructed Deviation
- Market principles behind "Revenue Adequacy" Payments & Charges
- Computing Day-Ahead & Real-Time Revenue Adequacy (bid recovery cost)

Payments for Generators

- How Does ERCOT and CAISO allocate Day-Ahead and Real-time Revenue Adequacy charges
- Reviewing special settlement charges for Reliability Must Run (RMR), resource adequacy and capability payments

Using Congestion Revenue Rights (CRR) Contracts to Hedge Against Congestion Costs

- Types of CRR Contracts
- Settlement Calculations for CRR Contracts
- CRR Procurement Process
- Strategies for Structuring CRR Portfolio to Hedge Against
- Congestion Costs vs. Congestion Revenues
-

Strategies for Bidding Ancillary Services

- Ancillary Services products offered under ERCOT Nodal Market
- Formulating Ancillary Services offers

- Understanding opportunity costs
- Understanding Ancillary Services deployment costs and probabilities

- Do marginal prices for Ancillary Services include opportunity costs?

- Objective function of the Security Constraint Unit Commitment
- Understanding causes for price reversal
- Computing revenues and costs for providing Ancillary Services
- Reviewing bidding strategies for Ancillary Services market mitigation

Rules for Market Monitoring and Mitigation

- Definition of physical and economic withholding
- Mitigation penalties
- Competitive path criteria

Bidding Strategies for Loads and Transactions

- Day-Ahead & Real-Time Settlement for loads
- Why use Price-Responsive demand bids?
- Reviewing Demand-Bidding strategies
- Why use virtual bids and offers?
- Day-Ahead & Real-Time Settlement for internal & external bilateral contracts

Running Shadow Settlement to Check Invoices

- Key differences in settlement rules between Zonal and Nodal markets
- Understanding settlement statements and charge types for New CAISO and ERCOT Nodal Markets
- Why perform shadow Settlement?
- Key functions of Shadow Settlement Software

  - Mapping data sources to support Shadow Settlements
- What are the most common causes for settlement disputes?
- Managing settlement disputes
- Goals for Settlement Allocation

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TEAM PROFILES

Ziad Alaywan, P.E.

Ziad Alaywan formed ZGlobal Inc. in early 2005 after working for almost a decade with the California Independent System Operator (CAISO), the control center responsible for ensuring a reliable power system for the state's 33 million residents. In 1996, prior to the formation of the CAISO, Ziad worked for the CAISO trustees and led the start-up effort of the new organization, focusing on the development and implementation of the bidding, scheduling, pricing and settlements systems. He was one of the first employees hired by the CAISO in May of 1997, where he was instrumental in the start-up of the pioneering organization with responsibilities included hiring staff, negotiating multi-million dollar contracts, and managing several hundred million dollar projects with multiple venders and utilities in governmental and stakeholder environments. Ziad successfully implemented the CAISO markets and operating systems within one year, as was his charge.

Ziad worked his way up to Director of Market Operations and Managing Director of Engineering and Operations Market Operations at the CAISO. His achievements at the CAISO included leading the start-up of grid operations and the redesign of the new market structure following the 2000-2001 power crisis.

Previous to his work at the CAISO, Ziad was employed by Pacific Gas & Electric, the largest utility in California with over 23,000 MW of demand. Ziad held the posts of Plant Engineer, Senior Operations Engineer, Transmission Planner and Manager of Real-Time Grid Operation from 1988 to 1990, Ziad was lead engineer in implementing a new energy management system and a SCADA system for PG&E.

From 1990-1996, Ziad supervised the real-time operations of PG&E generation, transmission, and scheduling in the Energy Control Center located in San Francisco.

Ziad holds bachelors and masters degrees in Electrical Engineering from Montana State University. In 2002, he completed the Executive Management Program at the Haas School of Business, University of California at Berkeley. Ziad has written over 50 publications on a variety of subjects from electricity market design to implementation and operation of the electric grid. He has given numerous testimonies at FERC, the California State legislation, the California State Senate and the CFTC. Ziad is a certified Professional Engineer in the State of California and is a Senior IEEE member.

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Steve Auradou

Steve is a ZGlobal Senior Associate who has held various positions at the California Independent System Operator (CAISO) beginning in 1997. As the Senior Manager of Market Integration and Testing, he was responsible for the management of all scheduling and bidding of transmission, ancillary services and real-time activities, as well as end-to-end (bid to bill) business functionality for all market systems, including settlements. He also was Manager of Business Process, playing the liaison role in market quality, and operations support and training in order to ensure smooth operations between grid operations, market operations and scheduling departments. As a Grid Resource Coordinator at CAISO, Steve led system integration testing during the market start-up.

Previous to the CAISO, Steve was employed from 1980 to 1997 at Pacific Gas & Electric, California's largest electric utility. He held several positions including real-time energy trader, power system dispatcher and power plant operator.

Steve has a Business degree from Mendocino Community College.

He is our expert in the area of Real Time System Operations, Power Plant Operations, Energy Scheduling, Control Area Operations, Forward Energy Markets, Congestion Revenue Rights, Locational Marginal Pricing Energy Market Design and Asset Optimization.

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Christine Vangelatos

Christine joined ZGlobal as a Senior Associate after nine years with the California Independent System Operator (CAISO). Christine was part of the California start up team responsible for the business requirements and testing of the market scheduling systems. Having held various market, engineering and management positions, Christine's most recent assignment was the Manager of Settlements where she managed the team responsible for designing the systems used for the CAISO Market Settlements. While at the CAISO, Christine also held positions as lead Market Operations Engineer and Manager of Market Quality. Prior to working at the CAISO, Christine was a Senior Operations Engineer at Pacific Gas & Electric from 1992-1997 in the System Operations Department. Christine has a Bachelor of Science in Electrical Engineering from California Polytechnic State University, San Luis Obispo as well as a Masters degree in Computer Information Systems.

Christine is our expert on energy transactions, settlements, dispute resolutions, CAISO tariff and product development. She is invaluable to our clients providing solid technical leadership and direction to a team of systems engineers performing concept evaluation, gap analysis and optimization studies.

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Brian Rahman, P.E.

Brian Rahman joined ZGlobal as a Senior Associate after nine years at the California Independent System Operator (CAISO). He was a part of the CAISO start-up team, joining the organization in 1997. Brian was also the Manager of Market Operations from 2000-2005, where he served as the technical expert for design, implementation and testing of CAISO market systems and a Senior Market Design Engineer from 1997 to 2000, where he developed and supported market applications and software for CAISO real-time operators and market participants.

Prior to joining ZGlobal, Brian's most recent responsibility was Program Manager for the Market Redesign & Technology Upgrade (MRTU) program at the CAISO.

The MRTU program includes the wholesale replacement of the organizations market and settlements systems and modifications to approximately 15 supporting applications. Deployment of an open architecture technology to support future flexibility and corporate needs is also included in the program's $189 million budget. Brian led the MRTU team, which has 160 dedicated members, since July of 2005.

Previous to the CAISO, Brian worked at the Pacific Gas & Electric (PG&E) Company for six years. In 1991, he joined the corporation as a Power System Engineer. He then worked as a Hydro Generation Electrical Engineer from 1994-1996. Brian also spent a year providing electric planning and operations support as a Distribution Engineer and completed his tenure as a Lead Electrical Engineer where he planned, designed and developed work plans for PG&E hydro facilities.

A graduate of Washington State University with a Bachelor of Science in Electrical Engineering, Brian is a registered Professional Engineer in the state of California and is a member of the Institute of Electrical and Electronics Engineers (IEEE).

Brian is our expert in the areas of project management, business case development, gap analysis, business processes, asset management and CAISO MRTU.

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Masoud Shafa, P.E.

Masoud Shafa joined ZGlobal after over nine years with the California Independent System Operator (CAISO). Masoud was part of the CAISO start up team and held positions in Market Services as Lead Engineer and Manager of Settlements, leading a team responsible for testing settlement software, review and resolution of disputes, analysis of market data, analysis of the impact of market design changes and training. In his most recent position, Masoud served as a lead engineer responsible for developing and resolving policy issues related to CAISO's Market Redesign Technical Upgrade (MRTU) project.

Prior to joining the CAISO, Masoud worked for the Los Angeles Department of Water & Power as an Electrical Engineering Associate from 1989-1997 in Power Design and Construction, Power Distribution and Transmission Planning. Masoud has a B.S. in Electrical Engineering and a MBA from San Diego State University and he is a registered Electrical Engineer in California .

Masoud is our expert in the areas of CAISO Tariff, transmission rates, congestion revenue rights, settlements, Locational Marginal Pricing, energy market design and asset optimization.

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Brian Rothstein

Brian joined ZGlobal as a Senior Settlements Associate providing expertise on MRTU Settlements and software design. Brian's 4 years of experience configuring charge codes in the SaMC (Settlements and Market Clearing) System makes him a valuable asset in understanding and validating Settlement files.

Prior to joining ZGlobal Inc., Brian worked as a Senior Settlements Design Analyst at the California ISO. He authored many of the Settlements Charge Code Business Practice Manuals (BPMs) ensuring that Tariff requirements are captured accurately. Brian held a significant role in the configuration and testing of MRTU charge codes in SaMC. He has also created MRTU training materials and led participant training and walkthroughs of MRTU Settlements.
Prior to working at the California ISO, Brian worked as a Business Analyst in the telecommunications industry for AT&T Wireless and Verizon Wireless. He has 6 years of experience in Billing and Revenue Assurance.
Brian is a graduate of the University of California at Davis and is Oracle-trained in SQL and PL/SQL.

Brian is our expert in the areas of MRTU Settlements, Charge Code configuration and validation, business analysis, and software design.

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Jenny Mueller

Prior to joining ZGlobal as a Transmission Engineer, Jenny Mueller was an Operations Engineer at the California Independent System Operator (CAISO). Jenny performed detailed technical analysis of the California transmission system using industry standard applications. Her primary responsibilities included developing operating limits and procedures that adhere to current reliability standards (WECC and MORC), providing real time engineering support and the

development of automated computer programs to allow for comprehensive monitoring of transmission system performance. Jenny also conducted large generator interconnection and Local Capacity Requirement (LCR) studies. Jenny received her Bachelor of Science in Electrical & Electronic Engineering at California State University, Sacramento and she is EIT and NERC certified.

Jenny is our expert in the area of generation and transmission modeling, optimization, transmission interconnection studies, economic analysis, cost benefit analysis, renewable energy and large generation interconnection processes.

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Thomas Breckon

Tom Breckon retired from Northern California Power Agency after completing a career of over 25 years. As the Agency's Manager of Information Systems, he was responsible for the development and automation of NCPA's front and back office business systems, wholesale power systems including power scheduling, dispatching and settlements, and SCADA. Tom's experience with the California ISO is from the customer side, having played a key role on the implementation of NCPA's unique load-following Metered Subsystem Aggregator contract with the CAISO. Tom led NCPA as a complex CAISO Scheduling Coordinator, aggregating a dozen municipal owners of over two dozen jointly-owned generating units and about 35 grid-level load meters.

Tom was heavily involved with the California ISO from the beginning. In 1997 he was an active participant in the Scheduling Coordinator User Group and was elected to lead the ISO/PX/SC Interface Team. In that capacity Tom successfully advocated that the new CAISO provide API's to allow automated interfaces with market participants. He contributed the first specification of the power scheduling API that was implemented at market startup, in continuous use for 10 years when finally replaced by newer technology as part of the CAISO's MRTU nodal market. Tom was part of the team that initiated the first technology working group at the CAISO for market participants, today called the System Interface Users Group, and he has been a continuously active participant in the CAISO's Settlements and Market Clearing working group for MRTU.

Tom's information technology experience ranges from project management to business process design, applications design, local and wide area networking, and database development. Tom's experience provides an invaluable resource for supporting

ZGlobal's GridSelect® suite of applications. In recent years, Tom's Department at NCPA developed significant power scheduling and settlements applications using SOA and Web based technologies. Tom led a project to utilize XML database technology to process the CAISO's very large and complex MRTU settlements files, which NCPA contributed as open source to all market participants free of charge.

Tom holds a BA in Math from UCLA, an MS in Computer Science from the Naval Postgraduate School, and a post-graduate certificate in Management Information Systems from American University.

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Gary Brown, P.E.

Gary Brown joined ZGlobal after 25 years in the energy and project management field. Gary's experience is in the areas of design and implementation of power systems, SCADA and process controls for water and wastewater utilities, Municipalities, and Districts throughout California. He is responsible for applying sound Project and People Management principles and skills in the development of business opportunities, skills development of assigned technical resources, coordinating design efforts with other engineering disciplines, developing project work breakdown schedules, cost estimating, communications plans, and providing QA/QC and technical oversight of many varied designs and applications.

Prior to his work with ZGlobal, Gary worked as Lead Project Manager for California ISO (CAISO) from 2002-2006 developing and implementing the new large interconnection process (LGIP), as a Group Leader/Principle Engineer at Westin Engineering from 1991-2001, as an Engineering Manager at Shorrock Electronics from 1989-1991, as Manager of Engineering at Professional Electronics (1985-1989), as Product Development Engineer at Genesis Electronics (1984-1985), as Communications Engineer at Halifax Engineering (1983-1984), as Staff Electrical Engineer at Trend Corporation (1981-1983), and as a Microwave/ Communications Technician for the United States Air Force from 1973-1976.

Gary has an Associates in Science in Communications Technology from the Community College of the Air Force, a Bachelors in Science degree in Electrical Engineering from

the University of Oklahoma, and a Masters of Business Association and Technology Management from the University of Phoenix.

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Bruce Centurino

Bruce joined ZGlobal as a Senior Transmission Engineer providing detailed economic analyses based on current and future CAISO model designs. His strengths are performing cost and bid assessments based on optimization and dispatch analyses, which allow energy providers to forecast economic risks and benefits.

Prior to joining ZGlobal Inc., Bruce worked as an Operations Engineer at the CAISO. He was the engineering project support lead for the CAISO MRTU project providing engineering expertise on model development, constraint definition, and model validation. Bruce was also instrumental in training transmission and generation dispatchers on the latest procedures. While at the CAISO, Bruce performed technical analysis for SDG&E and SCE systems. Bruce holds a Bachelor's Degree in Electrical and Electronic Engineering from California State University, Sacramento.

Bruce is our expert in the areas of transmission planning, resource optimization, stability and power flow analysis, economic analysis, cost benefit analysis, local reliability requirements and large generation interconnection processes.

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Chuck Wu, P.E., Ph.D.

Chuck Wu joined ZGlobal after 25 years experience in transmission planning, generation siting, and system operations. As a Power System Planner, Chuck has led SCE's annual Expansion Plan Studies for the bulk system (230kV and above) for short and long term transmission expansion. He has also worked with SCE operational flexibility planning, and developed new programs to mitigate transmission bottlenecks. Assignments have included 2005 SCE Transmission Expansion Studies, Inland Empire Energy Center System Impact/Facility Study, SONGS Voltage Operating Nomogram development, and SONGS Long term Voltage Operation Mitigations. Chuck developed the Valley VAR Support Project, including securing CAISO approval and SCE internal technical and budget approval. In addition, Chuck supported project design and secured WECC subcommittee

approval for final design and construction, developed and supported South of Lugo N-2 RAS Operation including system studies and RAS design, developed and supported new 500kV Rancho Vista Substation in LA basin and line reconfiguration project to provide additional transfer capability to meet local needs.

In addition, Chuck has worked at CAISO as a Manager of Operations Engineering (1997-2004). He worked as a System Operations Reliability Specialist Bulk Power (1994-1997) and Electrical Engineering Associate (1986-1994) for Los Angeles Department of Water and Power, and then as an Assistant Director in the University of Southern California Electric Power Laboratory (1980-1985).

Chuck has a Bachelors of Science degree in Electrical Engineering from National Taiwan University, a Masters of Science degree from the University of Southern California, and a Ph.D. from the University of California.

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Dr. Mingxia Zhang

Mingxia Zhang worked at the California ISO as a Lead Market Monitoring Specialist. Dr. Zhang is an experienced lead economist familiar with the California wholesale electric market and having a strong theoretical and practical background in applied economics. He is Familiar with all aspects of the current CAISO market design and understands various aspects of MRTU. Mingxing demonstrates strong ability in bringing large, cross-department level projects to successful completion. Dr. Zhang was a major contributor to the CAISO's Transmission Economic Assessment Methodology (TEAM) and is an expert on cost-benefit analysis of economic transmission and generation expansion projects. Mingxing has strong quantitative analytical skills and is familiar with SAS and Oracle SQL in addition to being an expert on utilization of the electricity production cost simulation software package Plexos for Power System. Mingxing Zhang, PhD received his M.S. from the University of Nebraska – Lincoln, Agricultural Economics and his Ph.D. from the University of California – Davis, Agricultural & Resource Economics.

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