



Market Tracking System

Request for Information Issued by
the California Air Resources Board
Office of Climate Change

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June 10, 2010

Presented by

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Office of Climate Change

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June 10, 2010

Mr. Matthew Botill
Mr. Raymond Olsson
California Air Resources Board
Office of Climate Change
1001 I Street, P.O. Box 2815
Sacramento, CA 95812
USA

RE: Response to Market Tracking System Request for Information

Dear Mr. Botill and Mr. Olsson:

Thank you for giving Deloitte the opportunity to respond to the Request for Information dated May 24, 2010 ("RFI"), in which the California Air Resources Board, Office of Climate Change ("ARB") is seeking to obtain certain information regarding a greenhouse gases cap-and-trade market tracking system

We understand that under California AB32, the Global Warming Solutions Act of 2006, ARB has been charged with operationalizing a cap-and-trade market tracking system. ARB desires that the auction, market registry, trade data repository, and compliance sub-systems of the cap-and-trade Market Tracking System should become operational by the end of the third quarter of 2011 in order to allow for the cap-and-trade program to be effective by January 1, 2012.

We understand that you are exploring the requirements to develop and/or implement an IT system that is: capable of handling very high volume of transactions; will support trading by hundreds of entities; will enable market transparency, including market data collection and dissemination; will enable trade data collection, analysis and reporting; and which will support market oversight functions.

We are eager to demonstrate our ability to ARB with the program management, technology support, functional design and implementation services you seek. Deloitte has been serving the State of California for a number of years, and we would be pleased to provide the same high level of service on this important project. To that end, our objective in serving you is to consistently do so in a manner that is collaborative and delivers real value. We believe our value proposition is our ability to assemble an experienced team that can provide a broad array of strategic assistance to ARB as you address the challenges and opportunities ahead related to this project.

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With this response, we hope to demonstrate to you that there are a number of clear advantages that we think make Deloitte the right team to assist you, including:

- **Deloitte's leading enterprise sustainability and carbon markets capability**
- **Deloitte's experience in working with exchanges in delivering technology solutions**
- **Deloitte's strong relationships with sustainability standards-setting bodies**
- **Deloitte's experience in commodity valuation and transacting risk management**
- **Deloitte's ability to leverage internal and external relationships**

We are excited about the opportunity to describe our capabilities to you as it relates to your specific questions. Should you have any questions about our response, or if you desire any additional information, please do not hesitate to contact me directly at + 1 973 602 5206 or sengler@deloitte.com.

Thank you again for taking the time to consider Deloitte's capabilities and the value we can bring. We look forward to deepening our relationship and bringing value to ARB.

Sincerely,
Deloitte & Touche LLP



By: Stephen Engler

Director

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Section A: Our understanding of your needs

As provided in the Request for Information dated May 24, 2010 (“RFI”) for California’s Market Tracking System, the Air Resources Board (“ARB”) of the State of California is in the planning and analysis phases of identifying the needed functions of an information technology (“IT”) solution to be utilized in the operation of a statewide cap-and-trade system. The IT solution that ARB is considering will support its overall administrative responsibilities in implementing a cap-and-trade system. ARB endeavors to have such an IT system operational by the end of the third quarter of 2011 in anticipation of the cap-and-trade program becoming effective on January 1, 2012. Accordingly, ARB is seeking feedback on the draft functional requirements included in the RFI and other relevant information from potential service providers with knowledge of and experience with implementing similar IT solutions.

Specifically, this IT system will support ARB in its goals of:

- Provide for market transparency
- Allow for market oversight, including compliance and enforcement
- Create a system for cap-and-trade program administration
- Minimize program administration costs
- Create a functioning market tracking system for compliance instruments by the beginning of market implementation (by January 1, 2012)

To meet its program goals, ARB has stated that the market tracking system needs to:

- Link to selected trading facilities to collect and record pre-and post-trade transactional data.
- Include a Market Data Reporting system to provide timely and accurate information to market participants and the public.
- Allow for market oversight, including compliance and enforcement
- Compile and produce trade data collection, reporting, record keeping, and audit features for oversight agencies.
- Have readily accessible data from a market registry with user accounts and compliance instrument tracking for administration by ARB. The market registry serves as an electronic depository for all authorized compliance instruments held by California cap-and-trade program participants.
- Automate, to the extent possible, market registry, trade data repository, and public reporting of market information. Leverage existing platforms – both technological and institutional – where appropriate and economical.
- Be aligned to existing regulatory and legislative requirements, including emissions reporting and verification mechanisms and regulatory enforcement procedures

We also understand from the RFI that ARB currently has an emissions reporting and verification system, as well as established regulatory enforcement procedures. ARB desires a new IT system that has the ability to link to other markets; leverage prevalent standards of financial data communication and transaction processing; and implement system security protocols and privacy technologies to support cap-and-trade processes in accordance with the State of California information policies and standards.

From experience, we know that new IT system implementations, such as the implementation of a Market Tracking System for California, are complex projects. The RFI contains in draft form preliminary project administrative goals, and high-level system functional and design requirements. Further complicating these goals and requirements is the need to simultaneously meet the needs of a diverse group of stakeholders each with varying objectives in the market. Careful analysis, along with a structured approach and diligent management are necessary to implement a system that is broad and effective within the defined timeframe. Thus, the evaluation and, ultimately, the selection and implementation of an IT solution that meets the needs of California's Market Tracking System will need to be conducted not only carefully, but also expeditiously, to effectively meet your target go-live date.

We laud your efforts to gather advance knowledge. We strive to provide information that will help to facilitate your future decisions concerning the above-mentioned implementation. We believe that Deloitte can add value by bringing an external perspective, as well as a structured approach and relevant experience to your team.

Section B: Overall Experience and Capabilities

Who we are

Deloitte is a member firm of Deloitte Touche Tohmatsu (“DTT”), an organization of member firms around the world devoted to excellence in providing professional services and advice, focused on client service through a global strategy executed locally in 140 countries. With access to the deep intellectual capital of approximately 165,000 people worldwide and more than 42,000 within the US, we deliver services in four professional areas—audit, tax, consulting, and financial advisory services—and serve some of the world’s largest companies, as well as large national enterprises, public institutions, locally important clients, and successful, fast-growing global companies. Our professionals have been developing effective business solutions and innovative performance improvements for domestic and international organizations for more than 150 years.

Deloitte’s Enterprise Sustainability practice

DTT has an industry-leading Enterprise Sustainability practice that provides a range of advisory services across the spectrum of industry sectors with the full lifecycle of sustainability and carbon management: strategy, planning, implementation, reporting, and verification. We have access to resources of the DTT member firms in 140 countries that can deliver services in accordance with local requirements.

A significant component of our Enterprise Sustainability practice focuses exclusively on delivering carbon management and climate change advisory services including

- technology consulting,
- risk identification, assessment and mitigation,
- emissions reporting,
- quality assurance and controls,
- governance, risk policies and procedures,
- compliance strategy and mitigation curves.

These capabilities are supplemented by Deloitte’s multi-functional capabilities including assurance, tax incentives and credits, environmental liability economics, business case development and financial modeling. Additionally, our deep industry experience and breadth of technology integration capabilities is core to our ability to deliver value to our clients.

The Enterprise Sustainability practice can leverage experience that resides in other parts of Deloitte to provide seamless service to our clients, as when needed. For instance, DTT is a dominant market player performing a wide range of valued services for leading Alternative Trading Systems and Exchanges to the financial services industry. DTT has more than 150 practitioners around the globe who have experience providing services to exchanges in a wide variety of different business functions. Additionally, DTT has a leading practice that is dedicated to serving public sector clients at the federal, state, and local levels in the US.

Deloitte's Enterprise Sustainability practice leaders come from all functions within Deloitte — audit and enterprise risk, financial advisory, tax, and consulting — and bring a diverse set of experiences and skills in the areas of asset and project management, climate change and carbon markets, sustainability, trading and regulatory assessment and compliance (See Appendix A – Team Member Profiles).

Deloitte together with other DTT member firms are strategic partners of the World Economic Forum and a member of the G8 Climate Change Roundtable, which provides business advice on market-based solutions to climate change. In 2007, DTT member firms entered into a five-year partnership with the Boao Forum for Asia, an organization formed several years ago among Asian nations to address issues particular to the region. In addition, DTT member firms have been strong participants in key international climate change forums. DTT member firms are a member of IETA and WBCSD. Members of DTT's Global Climate Change and Sustainable Resources practice have participated at the Carbon Expo meetings in Cologne, the Carbon Forum America conference in San Francisco, Navigating the Carbon World, and the United Nations Framework Convention on Climate Change Conference of the Parties serving as the Meeting of the Parties meetings, and are frequent speakers at industry conferences.

Deloitte's Financial Services Practice – Alternative Trading Systems (ATS) & Exchange Services Group

Deloitte has successfully delivered a wide range of services for leading Alternative Trading Systems ("ATS") and Exchanges. Deloitte has provided leadership and insight from an industry perspective and specializes in the areas of strategic thinking, market infrastructure, regulatory support and regulatory improvements. Deloitte advises clients as they evaluate new products and new business lines and has assisted clients in the development of new technology systems, new business processes, and support applications. Deloitte has worked closely with domestic and international exchanges supporting this critical role in the financial services industry.

Deloitte's ATS and Exchange specialists are very active in the marketplace participating in many eminence building activities. Our team members are actively producing thought-provoking white papers, conducting well-attended roundtables and speaking at prominent industry conferences. Deloitte has long been recognized as a leading professional services organization serving the securities markets. Our depth and breadth of experience provides our clients with broad and balanced perspectives on issues of importance to the industry.

Specifically, our exchange service offerings consist of:

- **Regulatory Support** – Experience in helping exchanges and ATS companies enhance operational effectiveness and efficiencies as well as manage their regulatory commitments and responsibilities
- **Administrative Services** – Specialized services focused on the core business units of exchanges and ATS companies, including Audit, HR and financial management
- **Operational Systems** – Experience in implementing technology and operational systems which enable supporting business functions to enhance overall operational effectiveness and strategic positioning
- **New Business Development** – The ability to deliver creative, efficient and innovative ideas coupled with deep understanding of the marketplace that are designed to help clients plan their business strategies.

Deloitte’s Federal and State Government Practice

Deloitte serves as a trusted advisor to several of the largest state government agencies in the United States. We bring a team with deep federal and commercial financial services and commodity trading experience, including financial regulation and oversight, organizational design, operations, and systems. The team will bring a 360° perspective to this important undertaking and bring deep insight to many considerations in improving ARB programs.

The Federal practice professionals include former elected officials, ministers, cabinet secretaries, and other senior government executives helping to serve 50 Federal agencies. Additionally, Deloitte serves 97 percent of the Energy Fortune 500 and 89 percent of the Fortune 1000 Energy companies in a variety of capacities.

Our Long-Term Commitment to California

Deloitte has conducted business in California for more than 30 years and currently employs more than 3,500 Californians. Our commitment to California is reflected in our team of highly skilled professionals serving the state from offices located in 11 cities.

We have a long-standing relationship with the State of California, providing numerous consulting and technology implementation services to a variety of state agencies, helping these agencies deliver needed capabilities to citizens efficiently and responsively. It is Deloitte’s ability to match deep technical skills with the relevant industry knowledge that enables us to deliver high-quality results and value.

California Offices		
<ul style="list-style-type: none"> • Costa Mesa • Los Angeles • Sacramento • San Jose 	<ul style="list-style-type: none"> • Foster City • Oakland • San Diego • Santa Ana 	<ul style="list-style-type: none"> • Fresno • Rancho Cordova • San Francisco

Table 1 – Deloitte’s California Office Locations

Deloitte has a long-standing successful track record serving the state of California. Some past and on-going projects include:

- MyCalifornia State Portal
- Department of Child Support Services – State Disbursement Unit Project
- Department of Transportation Services – Integrated Maintenance Management Program
- Department of Health Services – Genetic Disease Branch Screening Information System
- Department of Water Resources – SAP Implementation
- Department of Health Services – Children’s Medical Services Network
- California Public Employees Retirement System – Straight Through Processing
- Los Angeles World Airports ERP Implementation
- Administrative Office of the Courts Case Management System

“Due to Deloitte’s strong and flexible project management and highly experienced staff, the comprehensive SAP system implementation to support finance, budget, procurement, and human resources was completed in a timely manner within the budget.”

*– John H. Kantz,
Los Angeles World Airports*

Supporting California Counties

Deloitte maintains long-standing relationships with 54 of California's 58 counties, providing change leadership, project management and systems design, development, implementation and maintenance services through a variety of projects, including:

- Interim Statewide Automated Welfare System (ISAWS)
- CalWORKs Information Network (CalWIN)
- County of Los Angeles Eligibility, Automated Determination, Evaluation and Reporting (LEADER)
- County of Santa Clara, SAP Implementation

This blend of experience means we understand the issues organizations like the ARB face and can deliver value. We have the scale and resources to bring leading talent and experience to this important project for the ARB and potential market participants.

Why Deloitte

Deloitte understands the challenge of designing and implementing a market tracking system for the participating entities under California's AB 32, the Global Warming Solutions Act of 2006 and is committed to working with ARB to deliver a successful outcome. This is reflected in the following section, in which we highlight what we believe to be the relevant strengths of Deloitte for this particular request:

- **Highly experienced:** Deloitte has access to experienced technology and exchange practitioners from the DTT member firms around the globe. These practitioners have experience providing services to exchanges in a wide variety of different business functions. We have assembled a team that includes some of our most experienced specialists and contractors, in the areas relevant to this request including: technology, business processes, emissions and allowance tracking system design and allowance registry operations. Please refer to Appendix A: Team Member Profiles, for a review of our team capabilities
- **Deep specialists:** We are a leading consultancy organization in the market, trading and risk management arena; with a practice area focused on ATS and exchange services, with hundreds more professionals in our Enterprise Sustainability and Federal & State Government practices, Deloitte is well positioned to assist you in your cap-and-trade market tracking system.
- **World leader in systems design and implementation:** Our track record in designing, implementing and integrating systems solutions is well established. Deloitte delivers. Our demonstrated methodologies are continually being updated with our most recent experiences and leading practices. We have access to practitioners who are skilled in the implementation of systems, including dedicated practitioners in a number of specialized technical areas, such as commodity trading, risk management, settlements, and emissions registries.
- **Deep project planning and management skills:** Deloitte is well known for its ability to plan and deliver large, complex projects. Many of the team members outlined in Appendix A have, in addition to their core emissions and allowance tracking knowledge, extensive project management and planning skills, and experience using these skills on similar engagements.

We understand carbon emissions and allowance tracking and are committed to delivering a successful solution

- Highly experienced
- Deep specialists
- World leader in systems design and implementation
- Deep project planning and Management skills

Select engagements for exchange systems, reporting, and system integration

Our industry experience can help to accelerate the design and implementation process, as well as aiding in the identification and mitigation of project risk, in order to meet the time frame detailed in the request for information.

New Derivatives Exchange Start Up

- Auction Design •
- Qualification •
- Business Requirements •
- Vendor Selection •
- Communication •
- Price Setting •
- Monitoring •

The client asked Deloitte UK to act as a trustee to realize a series of Virtual Power Plant (“VPP”) auctions. The auctions are held by a Danish integrated energy company with a leading position in Europe that supplies electricity, gas and heat to private and business customers (inter)nationally.

The auctions are the result of a commitment by a predecessor of the company to sell several thousand MWs of VPP capacity in relation to a merger with another dominant player in the Danish electricity markets. The auctions are intended to stimulate liquidity in the electricity markets.

Deloitte UK coordinated input from all participants (there were 7 different banks/brokers involved), ran workshops and design forums to develop business functional requirements for the derivatives exchange and smart order routing module, and helped to ensure that the business requirements addressed both detailed transaction processing as well as the initial rule setting and operational procedures.

Deloitte UK assisted the client in selecting vendors of potential technology and operational solutions, managed interaction with short-listed vendors, and documented the business requirements formally agreed-upon by the 7 consortium members.

US West Coast Energy Portfolio Manager

- State & Federal Regulatory Affairs •
- Trading & Scheduling Operations •
- Settlement Systems •
- Regulatory Reporting •
- Cost Avoidance •
- Risk Management •
- Vendor Management •

Deloitte & Touche LLP worked with the client to develop their capabilities related to physical energy markets that included a broad range of competencies such as; control area operator settlements, portfolio management, trading and scheduling operations, risk management, bilateral counterparty settlements, investor-owned utility remittance and revenue requirement administration, and State and Federal regulatory affairs. Deloitte & Touche LLP’s contribution subsequently grew to include the analysis and implementation of a shadow settlement system due to the State ISO’s Market Redesign and Technology Update that established a nodal Location Marginal Pricing market in the state.

During the course of the project, Deloitte & Touche LLP played key roles in assisting the client with developing and negotiating the Agency’s position on various regulatory matters, monitoring energy market and regulatory issues and determining potential impacts on the Agency’s business, and developing and implementing changes to the client’s operations in response to various internal and external influences. We assisted the Agency in selecting and implementing scheduling, settlement, and risk management systems by managing the system selection process and serving as implementer and integrator with a team of experienced technology practitioners and professionals

with business domain experience. Additionally, we have assisted in our client's development of its business model, organizational structure, and business processes and procedures, as well as our client's execution of historical settlement reconciliation, contract settlement analysis, dispute management, credit analysis, regulatory reporting, and various training for client staff.

- Exchange Design •
- Vendor Selection •
- Governance •
- Impact Analysis •
- Legal & Regulatory •
- Operations •
- Testing •
- System Deployment •

Launched the first 'dark pool' trading services for a European Exchange

The client sought maintain its market position and identify new opportunities for future growth. Dark pool trading, or anonymous trading at best price, was a novel concept and unrealized in the European market. Leveraging Deloitte UK's stock exchange market and infrastructure experience and its market strategy and technology experience, the client desired to implement a dark pool trading service.

Deloitte UK assessed a shortlist of leading trading platform technology providers and helped the client to select a team to provide the technology while preparing a business case covering service technology, marketing and sales, and commercial, legal and regulatory elements to persuade the parent company to support the venture.

Deloitte UK assessed requirements and carried out an impact analysis to help the client and technology partner understand the changes the new service would likely require, set up the project office structure and resources, and defined clear governance to implement the new dark pool service across both the client's and partner's businesses.

Deloitte managed the sales, marketing, compliance, operational and technology aspects of the program that were necessary to initiate, test and implement the new service.

- Data Repository Expansion •
- Interface Design •
- System Integration •
- Testing •
- Regulatory Compliance •

Canadian Bank

Automated Payment Exchange - System Enterprise Data Warehouse Solution Implementation

This leading Canadian bank's Enterprise Data Warehouse failed to capture transaction data from the existing pre-authorized payment system (Automated Payment Exchange or "APEX") at an appropriate level of detail.

Deloitte Canada was engaged to deliver a solution consistent with the client's strategic and operational goals. Major components of the solution included the following:

- Develop and implement regularly scheduled processes to extract and load detailed APEX transaction data to the Enterprise Data Warehouse
- Support system-integration testing of developed components within the overall ESI/EDW solution
- Expansion of existing data repository to capture new transactions regulated by the Canadian Payment Association.

The following technologies were used: DB2, COBOL, SQL and SAS.

As a result of the new, integrated solution, the client expected to improve its capabilities around the following business needs:

- Ability to detect and predict changes in customer behavior
- Support for predictive modeling
- Support for lending and risk management activities
- Better customer service and user experience that position the client to ultimately increase profitability.

This project was delivered on-time, within budget and met the client's project requirements. Knowledge transfer sessions were provided to help the client provide a strong knowledge base amongst the teams involved in the project.

- Project management •
- Business requirements •
- System selection •
- Detailed design •
- Testing •
- System deployment •
- Post production support •

Commodities Exchange and Clearinghouse

A commodities exchange and clearinghouse faced the challenges of a global marketplace and greatly increasing product complexity. Another exchange faced similar challenges and was looking for assistance in addressing them. In response, the two exchanges entered a joint venture to develop a new trade management and clearing system.

Deloitte Consulting LLP helped the client determine the feasibility of the joint venture by evaluating the commonality of the business processes and technology direction of the two exchanges, develop and monitor the project management infrastructure, including budget tracking, issue management, and schedule adherence.

Deloitte Consulting LLP also led and participated on teams from both exchanges in the multi-year effort to develop the underlying systems architecture and to design, develop, and implement specific business applications.

As a result of this project, costs and benefits were shared across two exchanges. Modules placed into production included real-time trade management, position management, product, organization and account, settlements, deliveries, margining, and banking. Subsequently, one of the clients was able to license the system to other exchanges, diversifying its revenue stream and securing its strategic position in the global marketplace

- Linkage & Integration •
- Business Analysis •
- Operations •
- Systems Analysis •
- Cost Savings •
- Risk Management •

Futures Exchange

A major commodities exchange identified an opportunity to increase market share and improve operational efficiency by acquiring another large exchange.

Together, they launched a project to explore a combination, perform due diligence, and prepare for the successful integration of the two exchanges.

Deloitte UK conducted business analysis to identify operational, organizational, and technological alternatives for the new merged exchange, and worked with the operating departments of both exchanges, investment bankers, and acquisition attorneys to identify an operational plan and potential cost savings, and to identify potential problems.

Deloitte UK also served as an implementation advisor for the operational and organizational aspects of the merger once it had been approved. The combined exchange has seen a significant volume increase and one of the exchanges, which prior to the merger had operated at a loss, has seen revenues rebound as a division of a larger exchange.

- System Design •
- Project Management •
- Technology Life Cycle •
- System Implementation •
- Governance •

Securities Exchange

Deloitte & Touche LLP was asked to design a new Listed Company Administration System ("LCA") that is now used by over 250 client personnel.

Deloitte & Touche LLP advised the technology and business teams on the design and implementation of the system,

performed project management tasks, and facilitated technology life cycle management.

Deloitte & Touche LLP designed and implemented the exchange's new website. This website has been rolled out to over 1,200 listed companies. The site is a business-to-business website that electronically supports operational and corporate governance requirements, including board management, 302 affirmation, and independence and CEO certifications.

Securities Exchange

Internal Controls •
Technology Integration •
System Development •
Analytics Support •
Reporting Solutions •
Systems Deployment •

The client's main goal was to implement an enterprise-wide controlling system to help enable effective control of financial data and planning. Deloitte Poland's solution was based on Oracle Hyperion and OBIEE technology as a replacement for existing Oracle Financial Analyzer system. The scope of the first phase of the project included the design and implementation of a company-wide planning and budgeting system. The main goals of the project were to:

- Create concept of a controls system
- Create a centralized and user-friendly planning and budgeting system
- Implement custom support applications integrated with controls system
- Create an interface between Oracle Hyperion and Oracle EBS
- Design and implement reports and analytical dashboards for end users
- Provide drill-through reports and administration dashboards for advanced users
- Support users of various levels with appropriate documentation and training

Securities Exchange

Technology Strategy •
Surveillance •
Business Processes •
Compliance •
System Implementation •

The client needed to assess and develop a new technology strategy for the market surveillance function. Under evaluation were existing surveillances, data, business processes, and systems.

Deloitte & Touche LLP analyzed current business practices and developed a master surveillance grid outlining business logic, workflow, resolution, and disposition requirements. Deloitte & Touche LLP developed a master technology blueprint for the surveillance business component, developed strategy for migration to new architecture, and developed leading practices to allow for regulatory oversight compliance. This blueprint has provided the foundation for the implementation of new technologies and business practices in the surveillance function.

Section C: Feedback

Based on our experiences in assisting exchanges and other clients, the requirements that ARB has outlined are at a high level. The system concept indicated in the RFI reflects a fairly high level process view of what ARB desires, rather than a technology and system architecture. A number of considerations in developing a cap-and-trade market tracking system should be considered for these requirements to be at a level that will assist the selection, implementation or development of a market tracking system. Some of these considerations include:

- Overall philosophy of ARB with respect to technology
- Detailed technical architecture for a market tracking system
- Process design requirements, especially those related to market participants, clearing, settlements and reconciliation
- Policies and procedures
- Rule-making oversight
- Monitoring
- Corporate governance (for example, member listing requirements management)
- Reporting requirements, for both internal and external stakeholders

Technology architecture of an exchange is often a key differentiator among exchanges and having a set of detailed requirements encompassing various considerations is one of the keys to success. In order to move to the next stage, ARB will need to develop a set of detailed requirements based on the business processes / functions that are to be included in the scope of the technology solution. Requirements should encompass business, technology (reliability connectivity, transaction throughput, security), and regulatory needs.

Detailed requirements not only allow for consistent assessment of third party vendors; but also allow for identification of gaps that may have to be addressed, that can drastically affect implementation costs and timelines. Detailed requirements also allow the more confident preparation of development estimates. Utilizing our knowledge and repositories of requirements we can assist ARB in fast tracking the requirements gathering phase. Our knowledge of the vendor marketplace and our demonstrated methodologies could help facilitate ARB's Request for Proposal development, issuance, scoring, and vendor demonstrations processes.

Our experience in developing custom built solutions will allow us to assist ARB in developing estimates for custom built solutions vs. buying an off-the-shelf system.

Proper analysis of cost benefits of the build vs. buy decision must take into account the full lifecycle of technology components. Deloitte brings the knowledge and tools to assist ARB in this endeavor.

Section D: Cost & Timeframe

ARB needs to consider a number of cost elements as it implements the cap-and-trade market tracking system. Cost elements will incorporate hardware costs, software costs, consulting services / system integrator costs and ARB internal costs.

The table below highlights, at a high level, areas ARB should consider when identifying costs, effort and time. With the limited information available and number of possible alternatives available to ARB, it is not practical to provide an estimate on costs at this time.

Area	Line items
Business Process	Proper documentation of business process will assist in defining scope
Requirements Gathering	Documentation of detail requirements is crucial to perform vendor evaluations and develop custom build solutions.
RFP	RFP creation, processing responses, vendor scoring, recommendations and development
Vendor evaluation	Vendor demonstrations, gap analysis, cost estimates development
Custom Build Analysis	Design and implementation cost estimate development (if required)
Technology Requirements	Includes hardware and associated software
Cost benefits analysis	Development of cost benefits, analysis of phased approaches and recommendations Includes technical architecture requirements
Design	Will depend on alternative selected by ARB. Design of custom build / configuration design of third party applications. Includes integration
Build	Will depend on alternative selected by ARB, Includes integration
Testing	Extensive testing will be required
Support / Maintenance	Ongoing costs

In Conclusion

ARB is taking key steps in implementing the mandate under California's AB 32. A great deal of work needs to be done between now and October 2011, ARB's market tracking system 'go live' date. The choice of a professional services advisor is a critical aspect in the successful implementation of a cap-and-trade market tracking system.

There are a number of clear advantages that make us the right team to assist ARB. Together with our member firms, Deloitte has been a trusted advisor to the majority of the global exchanges, both domestically and abroad. We have delivered high quality, high value services focused on operations and trading systems that have contributed to their success. Deloitte has consistently worked with our clients to improve operations, regulatory functions and finance excellence by providing staff with deep understanding of the different components of the market and the core technologies required to operate exchanges and ECN's.

Deloitte has worked with exchanges to develop requirements, design and build listing processes and manage the listed issues, corporate governance compliance and integration with trading systems. Deloitte has advised and designed regulatory functions by helping build core member regulation programs including examinations, member firm management and financial surveillance to oversee stability and capital compliance. We have assisted our clients to develop the processes and systems for participant registrations and licensing; helped to design and implement market surveillance functions including alert management, data repositories, and pattern development associated with market oversight. Deloitte has implemented customer compliant management functions, tracking of participant behaviors, the investigation matter management tools and business processes to support enforcement.

Taken together with our specialized practices in enterprise sustainability and commodity trading and risk management, Deloitte is unparalleled in our experience and ability to deliver a broad range of services. We remain committed to our long standing relationships with the State of California and look forward to building on that relationship through this important project.

Appendix A — Team Member Profiles

Following is a list of representative resumes of subject matter specialists that would be available to assist ARB in establishment of its climate change program as well as selection and implementation of the technology to support the program.

Steve Engler, Director, Deloitte & Touche LLP

Steve is a Director in Deloitte & Touche's Energy & Resources practice with over 18 years of experience in the energy industry in various engineering, operations and consultative roles. With Deloitte, Steve serves as the co-leader of the North American Carbon Management Services practice, which delivers carbon reporting, compliance and risk management services to clients under the various emerging North American regulatory and legislative schemes. In addition, Steve has worked with a number of energy clients to design and implement Enterprise Risk Management programs, including policies, risk assessment frameworks, and organizational design. Throughout his tenure with Deloitte, Steve has worked with energy companies to develop and implement policies, procedures and controls to identify and manage risks throughout the clients' organizations, including the trading, operations and risk management functions. He has managed a variety of engagements for energy industry clients, including risk assessments, policy development, system selection and implementation, retail billing and operations, business process redesign.

Prior to joining Deloitte, Steve was a manager with Arthur Andersen's Utility Consulting Practice, focusing on ERP and financial system implementation projects, process redesign and strategy consulting. Steve began his career with Public Service Electric and Gas Company in New Jersey as a lead engineer and, subsequently, a business analyst at a coal-fired electric generating station.

Robert Walley, Principal, Deloitte & Touche LLP

Bob focuses on clients in the banking and securities, exchange and ATS industries. He brings more than 25 years of experience in system design and development for the financial services industry, developing front, middle, and back office systems. During this time, he has also served as the systems architect for non-trading floor systems for a stock exchange.

Bob has a thorough working knowledge of the traded markets and regulatory and compliance functions. He focuses on risk management, market surveillance, examinations, case management, trading systems, and listings compliance. At Deloitte, he has advised several exchanges on leading practices, process improvements, and leading uses of technology for decision support. Bob has extensive experience in systems architecture, application design, data architecture, development methodologies, securities operations technology, building enterprise data repositories and warehousing, and enterprise reporting solutions. He has performed numerous assessment projects to evaluate the effectiveness of the functions, compliance to rules, and value to the organization.

Bob is responsible for developing and delivering services to the financial services industry, and focuses on working with clients to improve their risk management, trading, and compliance functions for the front, middle, and back office.

Michael Jamroz, Partner, Deloitte & Touche LLP

Michael P. Jamroz is a Partner in the Deloitte & Touche LLP's business risk advisory practice. He renders regulatory consulting services to large and medium-sized securities firms throughout the US. Consulting services include: (i) compliance reviews of securities firms with

SEC, FINRA and Federal Reserve Board regulations; (ii) assistance in structuring and testing the regulatory compliance and back office operations of new business lines for securities firms; (iii) assistance in conflict resolution between securities firms and securities regulators; and (iv) diagnostic counseling relating to new regulations or to the impact of existing regulations on new products. He also provides enforcement defense support services to securities firms and their counsel and assists securities industry audit professionals in resolution of regulatory issues. Prior to joining Deloitte & Touche, Michael spent 13 years with the Securities and Exchange Commission, Division of Market Regulation. Here, he supervised preparation of Commission Securities Exchange Act Releases, rule amendments, no-action and interpretive letters relating to the CFTC's net capital, segregation, and other financial responsibility rules affecting securities firms. He also rendered extensive routine telephone interpretive guidance to securities professionals employed in legal, accounting and securities firms. He supervised preparation of memoranda and reports relating to, among other things, international securities initiatives and Congressional inquiries; and, advised and consulted with Commissioners, the Division of Enforcement and the Office of General Counsel regarding draft Enforcement memoranda, releases, and Commission opinions relating to pending actions involving securities firms and the financial responsibility rules. Michael is a frequent speaker at industry and securities forums. He also has authored "The Net Capital Rule", *The Business Lawyer*, Vol. 47, No. 3, May 1992, "The Customer Protection Rule", *The Business Lawyer*, Vol. 57, No. 3, May 2002 and "A Historic Change in the Leverage of Securities Purchasing: The Advent of Portfolio Margining", *The Magazine of the Futures Industry*, January/February 2007.

David Myers, Partner, Deloitte UK

David is a Partner in the Deloitte UK Financial Services and Technology practices. He has over 20 years of global experience working in the capital markets industry. David is an specialist in the areas of trading, exchanges, ECNs, clearing houses and central depository systems, as well as investment bank operations, such as clearing, prime brokerage and collateral management. Specifically, this experience covers areas such as order management, order routing, "best execution", cross-product processing (e.g., collateral and margin), risk management, data vending and regulatory issues. He has extensive experience working in a variety of business lines, covering both cash and derivative processing. Specialist areas of work encompass: business and technology strategy creation; business and IT alignment; architecture definition; technology assessment and review; application development, roll out and support; and ASP/BSP offerings.

In addition, David has a background of implementing large change programs using technology for business advantage. David is a frequent conference speaker and contributor to industry bodies (e.g., FIA/FOA) who is regularly quoted by news agencies, such as CNBC, Financial Times, Financial News, Global Custodian, STP Forum, FOW and Dow Jones Telerate, on topics including banking technology advancements, exchange and clearing house developments, derivative trading innovations, and regulatory policies.

David holds a BE in Electric Engineering from the Thayer School of Engineering, Dartmouth College, Hanover, New Hampshire, USA; and a BA, Liberal Arts – Engineering Sciences, also from Dartmouth College.

He is also a board member of the Futures and Options Association. Prior to joining Deloitte UK, David was a partner at the Capital Markets Company (Capco) and a senior manager at Andersen Consulting (now Accenture).

June Niklus, Partner, Deloitte & Touche LLP

June Niklus is a Partner in Deloitte & Touche's Banking and Securities audit practice with over 17 years of experience, primarily serving broker-dealer and e-commerce clients. She is responsible for the coordination of audit, tax, technology, regulatory and consulting services for multi-national and domestic financial services firms. She has particular experience in SEC reporting and has participated in the preparation and review of SEC documents filed in connection with initial public offerings ("IPO"); an exchange demutualization; and merger,

acquisition and underwritten debt transactions. She also has assisted major alternate trading systems in IPO preparation and readiness assessments. June has served in the Sarbanes-Oxley implementation project management office for several of Deloitte's large financial services clients.

Susan Levey, Director, Deloitte & Touche LLP

Susan has over 17 years experience in the securities industry and financial services litigation consulting field while at Deloitte & Touche within the Governance Risk and Regulatory Services practice. Susan primarily focuses on assisting broker dealers effectively and efficiently operate within the applicable regulation given their business model, both from a sales practice and back office operations perspective. Most recently, Susan has been leading our supervisory controls work associated with the CEO certification regulation. In addition, major assignments have included assisting firms in responding to regulatory sweeps, assisting and being named as Independent Consultant by the SEC, NYSE, and FINRA (f/n/a NASD), assisting firms with remedial efforts associated with pre and post enforcement actions, assisting firms in performing process assessments based upon regulatory requirements, assessing trade reporting from a process, regulatory and data perspective, and performing various regulatory services to regional stock exchanges. Prior to joining Deloitte & Touche, Susan was the Data Management Specialist at Winston & Strawn, a law firm in Chicago, and was responsible for the creation of their Automated Litigation Support department.

Pat Concessi, Partner, Deloitte Canada

Pat is a partner with Deloitte & Touche Canada and co-leads the North American Carbon Management Services practice. Pat also serves as the leader of Deloitte Touche Tohmatsu's global Climate Change and Sustainable Resources group. Pat has consulted for many energy companies with respect to management of commodity risk and this increasingly includes emission allowances, renewable energy, bio fuels, and Clean Development Mechanism credits and investments. Her experience includes the review of internal control for companies that are active in trading emissions credits, and implementation of a risk engine for an energy company that is active in the European Union Emissions Trading Scheme ("EU ETS") and certified emissions reduction ("CER") trading.

Prior to joining Deloitte Canada, Pat had 19 years experience with a major electric utility, where she was responsible for the commitment and dispatch of a fleet of fossil-fired power plants. As a professional engineer and risk management consultant, Pat understands the impacts of climate change on energy company operations and risk profiles.

Roger Schaffland, Director, Deloitte & Touche LLP

Roger brings more than 20 years of high-level systems experience in program management, information technology and data architecture to the Global Energy Markets team. Primarily dedicated to serving energy clients, he helps companies in the power, oil and gas industries to develop business requirements and technical specifications, structure support services, design infrastructure and systems architecture, select vendors and implement software.

These skills have enabled Roger to help some of the world's largest energy companies and financial institutions to develop business and technical requirements to select and implement energy trading and risk management technology

Prior to joining Deloitte & Touche, Roger was Chief Technology Officer at a successful New York consulting firm specializing in front/middle/back office trading and settlement systems for financial companies in New York and abroad. This experience included leading teams and overseeing the technical implementation of systems, software and support structures for trading/risk management systems.

Vincent Tarantino, Senior Manager, Deloitte & Touche LLP

Vincent has a focus on clients in the banking, securities, exchange, and ATS industries. He has 10 years of experience in options and stock exchanges with a trading and regulatory

background. At Deloitte, Vincent has assisted a regional stock exchange specialist and asset management firms respond to regulatory inquiries related to trading practices. He worked with a start-up trading entity to develop and store an auction engine: he assisted the client as it identified and developed its operations and administration methodologies, drafted its technical specifications, and researched software and housing vendors. He was responsible for providing project management for defining the requirements necessary to build and implement, and for the development and implementation of a surveillance system for a regulatory entity.

At another regional stock exchange Vincent assisted in its trading system development, acted as the liaison between operations, information technology, regulatory, and various boards and was responsible for market surveillance, regulatory exams, market oversight, and surveillance system development for both options and equities.

At another stock exchange, Vincent's roles included: Equity and Options Investigator, Assistant Specialist, and Director of Options Reviews. His responsibilities ranged from trading system and order book management to trading and regulatory system development. He managed and led various initiatives, which made the introduction of Linkage, a floor broker management system, possible.

Prashant Shah, Senior Manager, Deloitte & Touche LLP

Prashant Shah is a Senior Manager with Deloitte's Energy & Resources practice. Prashant brings extensive energy trading & risk Management (ETRM), energy industry, risk management, consulting, systems implementation and project management experience to assist clients' in their trading and risk management needs. Prashant has a demonstrated track record in project management with ability to lead projects from concept to completion.

Prashant leads the Operations & Technology aspects of the Carbon Markets group. As part of the Carbon Markets group, Prashant has played a key role in understanding the business process and technology implications of carbon markets. Prashant has also co-authored an article on "Exploring climate change - Business process requirements for carbon transacting". He was also a Co-presenter at Deloitte's CIO Round Table on "Climate Change: Preparing for Carbon Disclosure, Reporting and Transacting". Prashant has led internal efforts on Business Requirements for Carbon Management systems and efforts around Greenhouse Gas (GHG) Management System vendor analysis

Prashant has led a quantitative (analytical) capability creation engagement focusing on earnings validation, price forecasting, fundamental analyses and technology surrounding analytical models for an oil super-major, development of global arbitrage model IT application for an oil super-major, an ETRM - Data warehouse assessment engagement for regional power major, ETRM functionality assessment for a regulated gas utility.

Prior to Deloitte, Prashant was Associate Vice President at a niche risk and compliance IT consulting organization. He was part of the management group, helped developed company strategy, and led many client relationships. Prashant has led ETRM system implementation, ETRM system assessment, market & credit risk implementation, market and credit risk reporting, Value-at-Risk (VaR), and business process projects. Prashant was the designated Subject Matter Specialist for ETRM and middle office processes. Prior to that, Prashant was at Accenture, Ltd. where he led many strategy and business process reengineering engagements.

Prashant completed a Master's degree in Management Studies at the University of Bombay. He also earned his Bachelor of Engineering from the University of Bombay.

Jim Sergenese, Senior Manager, Deloitte Canada

Jim Sergenese is a senior manager with Deloitte Canada and brings over 22 years of experience providing technology solutions to energy companies. As a Senior Manager, Jim's consulting work at Deloitte Canada has been focused in the area of systems architecture and integration in the energy industry. Jim has extensive experience in project management, system selection, gap analysis and implementation of Energy Transacting and Risk

Management (ETRM) systems and supporting applications, as well as managing the integration issues arising from utilizing the “best of breed methodology” across functions in the deregulated energy industry. Jim has led business process reengineering efforts and has proficient business knowledge of front, middle and back office processes. Jim has experience leading large project teams and follows a structured project management approach. He is also part of the technology team supporting Deloitte Canada’s Climate Change and Carbon Markets service line and has lead the development of contract system functional requirements for a major international emissions asset manager.

Prior to joining Deloitte Canada, Jim spent 15 year in the technology area of TransCanada Pipelines LTD, spending the last three years as Manager of Information Technology of TransCanada Pipelines USA Ltd., leading the technology teams supporting US trading operations.

Jim obtained his Bachelors of Mathematics from the University of Waterloo.

John Norden, Senior Manager, Deloitte & Touche LLP

John is a Senior Manager with the Deloitte & Touche LLP advisory service practice. John brings over 20 years of multi-faceted experience in the energy, commodity, and financial markets dealing with real-time and critical highly available systems. John has deep experience with regulatory, trading surveillance, order routing and exchange engines, project/program management, requirements definition, system integration, vendor selection, and implementation.

John’s product experience includes commodity and energy products both physical and derivatives across front, middle, and back office. John’s is experienced both on the buy and sell side of the market.

John has deep experience with project/program management, architecture, vendor selection, requirements definition, system integration, data warehousing, reporting and software development; he is also experienced with multiple development tools, technologies, methodologies and systems.

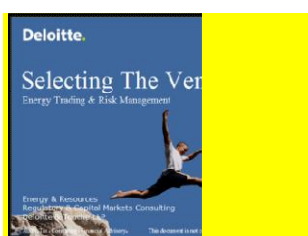
Howard Friedman, Senior Manager, Deloitte & Touche LLP

Howard has 16 years of experience in the energy industry. He brings to his clients a breadth of experience in advising energy industry stakeholders on corporate, regulatory, and market challenges facing their enterprises. His experience includes leading and working on industry issues for clients on such topics as FERC and NERC regulatory compliance, risk management, strategic planning, asset valuation, and generation market analysis. The client services he has provided have spanned across competitive wholesale and retail markets for both independent power producers and integrated electric and gas utilities. In addition to these clients, Howard has also provided energy and environmental advisory services to the Energy Information Administration (EIA) and the U.S. Department of Energy (DOE). Howard has published several articles on regulatory compliance and been an invited speaker to events hosted by the Federal Energy Regulatory Commission (FERC), the Edison Electric Institute (EEI), and the Energy Bar Association. Most recently, he led Deloitte’s Regulatory Compliance Program Benchmarking Survey, which involved over 40 companies providing their perspectives on existing compliance program capabilities within their respective companies.

Prior to joining Deloitte, Howard worked for Navigant Consulting in their Strategic Operations Group of their power and utility industry practice. Howard began his energy industry career with the MidCon Corporation, a natural gas pipeline company and retail gas marketer, supporting their regulatory activities in the Midwest and east coast of the United States.

Appendix B — Thought leadership and eminence

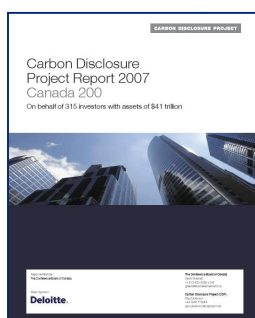
Each year, Deloitte and other member firms of DTT publish analyses, surveys, and other thought leadership pieces, and our leaders and practitioners frequently speak at industry conferences and professional organizations. Below is a sample of papers and analyses that have recently been prepared in the areas of GHG emissions management, climate change, carbon markets, carbon disclosure, and corporate sustainability.



Selecting the Vendor — Deloitte has developed guidelines for clients to assist with a system vendor selection. The document describes considerations for clients to enable a “fit-for-purpose” system selection taking into consideration near, medium, and long term costs and contractual considerations. The document highlights lessons learned that should be considered by clients when selecting an ETRM vendor based on our experience.



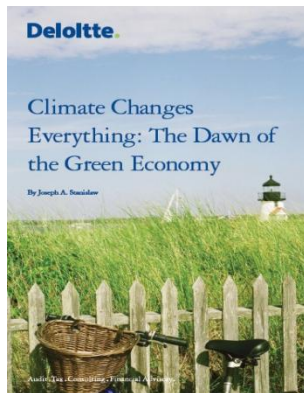
Limitations of Vendor-Led Implementations — This publication highlights the limitations of ETRM system implementations that are led by the software vendor. The document highlights conflicting end-goals of vendors and the client that lead to implementation projects of varying success.



Carbon Disclosure Project Report 2007 (Canada 200) — Deloitte Canada was the lead sponsor of an independent nonprofit organization’s Canada 200 initiative, which discloses investment related activities of the 200 largest companies on the TSX. Deloitte Canada worked closely with the advisory board to develop the Climate Disclosure Leadership Index, which measures the quality of the client’s responses based on both quantity of information disclosed and richness of content, and assessing the GHG inventory and emissions submission from each of the top 200 companies.



Confronting the carbon challenge: Business implications of the developing North American carbon markets — Momentum for development of North American carbon markets continues to grow, driven by the need to participate in international negotiations to be held in Copenhagen later this year, by the commitments and actions of the new U.S. administration, and by the steady progress of the Western Climate Initiative (WCI), among other influences. Businesses have accordingly been prompted to react to these existing and emerging U.S., Canadian, and cross-border carbon markets. This paper discusses what it could mean for businesses, including substantial incremental costs for entities in regulated carbon markets, business strategy, risk identification, governance and organization design, significant financial statement implications, and tax implications.



Climate Changes Everything: The Dawn of the Green Economy — Rarely has a single issue, climate change, so dominated the political debate and the public imagination. Will 2008 be the year of climate fatigue, or has the specter of climate change become so deeply rooted that it will lead to the transformation of consumer habits and the establishment of a truly green economy? The latest white paper by Joseph A. Stanislaw, independent senior advisor to the Energy and Resources Group of Deloitte LLP, discusses:

- Consumers taking the lead on climate change
- Climate change and corporations
- The coming revolution in the energy industry
- The rise of renewables
- How policy can create full and accurate pricing
- The policy toolkit — setting the goals and rules of the game