



June 10, 2010

Ms. Mary Nichols
Chairman – California Air Resources Board
State of California
Sacramento, CA

Chairman Nichols:

First, may we take this opportunity to thank you for your service and excellent work in continuing to bring the aims of the AB32 Scoping Plan and Cap-and-Trade Program to fruition. It is an exciting and vital program and has been well-served by the members and representatives who have worked so hard over the last few years to make the CA GHG emissions reductions program a reality.

The Pacific Carbon Exchange, a start-up environmental commodities exchange platform being built in San Francisco, CA focused on the unique requirements and carbon market opportunity here in the western region, is privileged to present these comments to the California Air Resources Board in response to the *Market Tracking System Request for Information* released June of 2010.

PCarbX offers these comments in relation to requirements outlined in the RFI document. We would like to stress that we believe the entire CA carbon market system is divided into two separate aspects: the allowance/offset tracking registry system and the carbon commodities trading/clearing platform. These platforms should be linked for compliance, tracking and account management purposes, but the platforms themselves must function and be maintained independently from one another. The information we are providing in these comments provides an overview of the functionality of our exchange platform only and does not address the separate functionality of the allowance tracking registry.

Thank you for this opportunity to provide information regarding the functionality of the trading mechanism for California's impending carbon cap-and-trade program. Please don't hesitate to use us as a valuable and enthusiastic resource for continuing to move forward with the design and implementation of the CA AB32 Cap-and-Trade Program.

Sincerely,

Aaron Singer
Chairman & CEO
Pacific Carbon Exchange



THE PCARBX TECHNOLOGY PLATFORM

The Pacific Carbon Exchange will be an easy-to-use, highly secure Internet-based trading platform, addressing both the environmental commodities spot and derivatives markets. PCarbX will feature a state-of-the-art matching engine, with intuitive front-end interfaces and data dashboards, enabling our members and broker-dealers to easily navigate, research, and trade the environmental commodities that will be offered through our exchange. As one would expect from any trading software platform where large volumes of commodities and cash are changing hands, a very strong emphasis will be placed on ease-of-use, security, scalability, and support.

EASE-OF-USE

PCarbX will invest substantial time and resources into ensuring that our trading platform is intuitive and very straight-forward for our members to use. One of the chief complaints about many of the early exchanges in this market has been the complexity of the programs available. PCarbX is analyzing current platforms in various trade markets, as well as conducting behavioral analysis within the trading industry to better understand how carbon traders would like a carbon exchange to function and interact with its users. By understanding the flow of information and the behaviors attached to that data flow, PCarbX will be able to leverage that understanding to create a software architecture that works for our members and brokers, not against them. The PCarbX exchange platform will also be able to leverage its command of the data cycle to bring increasingly deeper levels of critical market trending and data to our membership, facilitating decision-making and strategic planning for our members.

SECURITY

A secure trading platform is critical to the success of the California & WCI cap-and-trade programs, to the protection of our membership, and to the authentication of the California carbon regulatory framework. PCarbX will focus substantial development efforts on building a rock-solid, secure platform that can keep up with the tremendous requirements and expectations of a 21st Century trading platform. PCarbX will focus on a multiple data center configuration with ultra-secure web hosting and connectivity services distributed throughout. PCarbX will be required to operate multiple, fully redundant data server arrays contra-located to provide uninterrupted, dependable service to our membership, as well as redundant data protection and rapid disaster recovery response.

SCALABILITY

PCarbX's system architecture will also focus on rapid scalability. PCarbX will insure that we are in a position to not only handle rapidly increasing trade volumes within the California and western environmental commodities markets, but also have the ability to extend our reach throughout the United



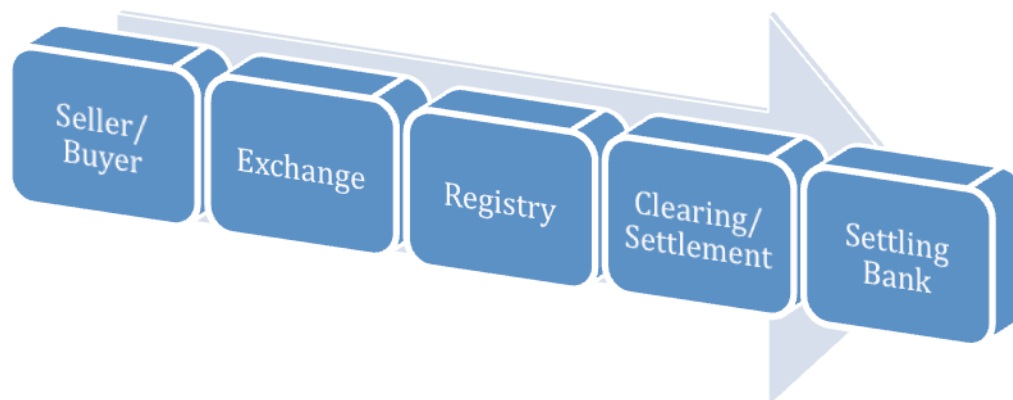
States and into the growing global markets, as well. Maintaining a scalable architecture will be critical and PCarbX will be partnering with the most capable and experienced partners in the commodities trading technology industry to guarantee that scalability in both our trading engine, data front ends and our data centers.

SUPPORT

PCarbX's investment in user-interface and intuitive information architecture will have a tremendous influence on support desk savings. PCarbX will also create a thorough, meticulously presented support website which will enable members to solve a large majority of their technical issues quickly, and without time-consuming phone calls. PCarbX will also maintain a live Help Desk available 24/7 to our membership and our broker/dealers to assist with any technical or user issues that may inevitably emerge.

INTERCONNECTIVITY & COMPATIBILITY

PCarbX will be working with several technology partners necessary to the accessibility, function and maintenance of something as complex as a commodities trading exchange. Interconnectivity between discreet systems, as well as connection to PCarbX's ERP, administration and knowledge management solutions will be critical to maintaining an unprecedented level of efficiency, as well as communication and productivity within the Pacific Carbon Exchange organization. Again, PCarbX will be working with partners with deep experience in designing interconnected internal/external solutions, as well as maintaining a highly talented internal development group focused on designing and maintaining the connectivity of this complex trading and communications system.



THE EXCHANGE TECHNOLOGY ARCHITECTURE

The PCarbX will be built around a centralized matching engine – the heart of the exchange. The matching engine processes all trades made on the exchange in real-time, matching buyers and sellers on the market at a rate of thousands per second.



This multiply redundant system also provides APIs for real-time interconnection between PCarbX's back-office architecture, clearing and settlement modules, carbon registries, and data pipelines to market news, data providers, and the carbon regulatory framework. These systems housed within highly secure, multiply redundant data centers will be designed from the outset to rapidly scale and easily translate to emerging markets and emerging environmental commodities.

The Matching Engine

The Matching Engine is a series of server-based software programs working in concert to rapidly match buyers and sellers in a split-second trading environment. The PCarbX Matching Engine will be capable of processing thousands of trades per second. Because the software architecture is distributed over a large number of industrial-quality data servers, the system is protected from centralized system failures or even substantial slow in trade flow if individual modules do fail. Data flow into and out of the matching system is real-time, enabling immediate price transparency in the market, as well as instantaneous flow to back-office and settlement/clearing modules. The Matching Engine also communicates directly with outside data sources critical to the efficient management of the exchange. As has been demonstrated



by the trade flow diagrams earlier, the PCarbX matching engine must communicate with the carbon registries, settlement and clearing houses, as well as outside news, data and regulatory organizations.

The PCarbX matching engine will have the capability to support time-based trade rules, quantity-based trade rules, and pro-rata/algorithmic trading rules ensuring the maximum number of counter-parties and liquidity are available for any trade. The engine will support multiple order types, including but not limited to limit, fill or kill, fill and kill, market, RFQs, cross-trades, date/time expiry, contingency MOCs and OCOs. The matching engine will also be able to handle a number of asset classes, futures and options, as well as providing forensic audit trails and trade replays of all exchange activity.

The matching engine will also have the capability to access outside systems and carbon registries where certified carbon credits are maintained, tracked and retired. PCarbX will write to various modular APIs to insure seamless data connectivity to various modules, maintaining consistent, real-time feedback loops to and from all modules with the matching engine.

Member Management & Risk Management

The member management module of the order matching system gives us the ability to set trading privileges on a member by member basis, set gross position limits, cash limits and intra-day cash cover limits, and set access and product restriction privileges. The matching engine will also be capable of managing risk assessment in real-time, performing real-time risk management pre and post trade. The risk-management module will enable us to check clip-limits, loss limits, long and short positions, and cash margining across multiple products. Post-trade risk management processes margin requirements, P&L strikes, limit assessments, and any associated alerts in real-time. The risk management module communicates directly with the clearing and settlement module and client back-offices, which allows the immediate impact of proposed trades to be assessed in real-time.

The Clearing & Settlement Module

Once trading parties have completed their trade requests and member and risk management modules have confirmed and implemented all privileges and restrictions associated with the trade, the transaction moves to our clearing and settlement module. This module allows PCarbX to manage down to the individual client level and communicates directly with our back-office system.

The clearing and settlement module tracks the entire trade process in real-time through:

- Price, trade, and allocation and open/close movements
- Positions updates with trade and position calculated
- P&L calculated and updated (contract and daily balance)
- Fees calculated
- Margin requirements calculated



- Collateral management checks deposits against margin requirements
- Fees/profit/loss transferred to bank clearing house
- Collateral deposited and withdrawn from counterparties

The clearing and settlement system conducts all master data and position management, does all delivery processing, creates a number of financial reports and statements including P&Ls, positions and margin reports, multiple scheduled settlement reporting, margin call processing, and other member data reporting. The clearing and settlement module also supports a number of surveillance reports and real-time trader analysis, allowing for a high-level of market transparency and reduction of compliance risk.

Back-Office Accounting, Clearing, & Transfer

The back-office module will maintain a real-time relational database of all member and exchange activity, allowing extensive reporting and exchange forensics, as well as tools for member management and for members to manage their own account activity and data. PCarbX back-office systems will provide book-entry accounting and delivery of allowances and offsets trades, allowing for the electronic delivery of ownership of environmental commodities changing hands.

Compliance & Market Data

Finally, the PCarbX matching engine and associated modules work in concert to enable real-time compliance data banking and access, as well as price and market data streaming to outside publishing vendors and regulatory authorities. These data streams will allow members to very easily manage their own regulatory compliance requirements associated with their trading, will enable PCarbX to manage its own regulatory reporting requirements, allow ARB and other regulatory agencies to maintain near real-time market surveillance, and allow price and market data to be published to members to help them manage their own real-time trade activity and decision-making. PCarbX market data will be available to dashboard/market data sources such as eSignal, Reuters, and Bloomberg using FIX 4.2 standards. Partners will be able to tap into data streams coming directly from the PCarbX platform creating pricing and volumetric transparency for the exchange on a real-time basis, helping regulatory agencies more accurately gauge the market and its compliance with applicable rules and regulations.

Registry Tie-ins

The offset and allowance registries in California and the Western Climate Initiative will be the central repositories keeping track of member entities' offset and allowance inventories. The Climate Action Reserve serves as the central registry for carbon offsets sourced in California and in the United States. CAR was created by the California State government as a research, rules-making and registry not-for-profit organization to further the mandate of AB32. CAR has developed the certification protocols, verification standards, and regulatory framework to certify and track their Carbon Renewable Tonne



(CRT) offset credit. CAR engaged APX, Inc. to create a tracking technology infrastructure to enable their membership to track the certification process and maintain an account inventory of their tradable credits.

PCarbX's exchange architecture will tie-in through APIs that APX is making available to interact with the CAR offset registry. PCarbX will be able to seamlessly access CAR offset account data as part of the real-time trade event flow, risk analysis and clearing/settlement of trades, ensuring the integrity of the transaction and the accounting of the offset lifecycle. This technology partnership is critical to the liquidity and efficiency of the exchange, enabling both partners to ultimately fulfill the intent of the cap-and-trade regime.

Carbon allowances for California and likely for the Western Climate Initiative, as has been previously discussed, will be certified and registered through The Climate Registry (TCR), an organization formed to specifically create registration protocols for entity carbon baselines and tracking of respective allowances. The Climate Registry utilizes a separate system than CAR for helping member companies register and calculate their emissions footprints. The Climate Registry Information System (CRIS) is The Registry's online greenhouse gas (GHG) calculation, reporting, and verification tool. CRIS also provides public access to The Registry's verified emission reports. It has still yet to have been determined how allowances will be tracked in California and the WCI, but it is assumed that APIs for the tracking system will be made available to enable data query and interaction with that system.

CONCLUSIONS

The Pacific Carbon Exchange believes that the environmental commodities markets to be created by AB32 and the Western Climate Initiative will be best served by the highest level of transparency possible in these markets. Many of the problems suffered in the EU-ETS and in nascent US voluntary markets have been due to lack of transparency and oversight. PCarbX believes that an exchange platform with trading, clearing, and settlement services integrated with a highly efficient reconciliation process between the exchange and the registry systems tracking allowances and offsets, offers an excellent model for market efficiency and transparency. An exchange is best suited to the cost-efficient capture of specific data necessary for regulatory frameworks to maintain market surveillance and market integrity.

As related to the highlighted comments by CFTC Chairman Gary Gensler in Section 4.1.2.4, Evaluation of Options, WCI Markets Oversight White Paper, PCarbX shares the view that we must lower risk and promote greater market integrity and market transparency. A regulated commodity exchange will enable a very granular level of regulatory surveillance on the market, providing real-time data on pricing and trading activities, as well as daily reporting on positions, trading volume, open contracts, futures delivery notices and other information required by ARB, the WCI and the CFTC. This is a distinct advantage of an exchange, as it will be difficult for the same transparency to be available in inherently opaque OTC markets without significant investment in a highly complex tracking mechanism by California and other WCI jurisdictions.