Assessing the Market for California Carbon Offsets

A discussion of products, market activity and deal structures for offset sales

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Business Overview

Company Overview

• NFA-registered Introducing Broker (IB) providing professional voice brokerage for wholesale energy and environmental markets
• Founded in 2000 by current management team
• Leader in the global energy and environmental commodities sector
• Privately held
• ~80 employees in New York, San Francisco, Houston, London, Cape Town, and Singapore
• Award-winning, client-focused services

Market Pioneer

• Largest dedicated environment and energy markets brokerage
• Advised market design of carbon programs in EU, California, and Northeast US
• Facilitated first trades in EU-ETS, California, RGGI, and RECs in NEPOOL, Texas, & PJM
• Evolution principals launched weather derivatives market
• Forefront of US coal and nuclear fuels markets

Extensive Counterparty Network

• Fortune Global 500 Firms
• Banks
• Hedge Funds
• Utilities & Power Generators
• Industrials
• Project Developers
• Private Investors

Services

• Market execution for energy and environmental commodity markets
• Structured environmental products
• GHG compliance strategy services
• Environmental asset origination, including carbon, emission credits, renewable energy & fuels
• Advisory on renewable power purchase agreements
• Market analytics and data
Our Markets

Energy
- Financial and physical coal
- Financial and physical natural gas
- Financial crude oil
- Financial and physical power

Emissions
- GHG emission markets (EU-ETS, Alberta, California-Quebec, RGGI and other evolving global markets)
- US federal and state NOx and SOx allowance markets, including ERCs and RECLAIM in California

Clean Energy
- Renewable power, including RECs & Green Power PPAs
- Physical biomass and biofuel markets, including RINs and LCFS credits
- Nuclear fuel

Water
- US water rights & wetlands banking markets; ecosystem services

Weather
- Weather derivatives and natural catastrophe securities
Traded Carbon Products

Carbon Allowances (CCAs, QCAs*)


Carbon Offsets (CCOs, QCOs)

Primary Market: project-specific, i.e. MMC CCO(3). Secondary Market: non-project specific CCO. Spot/issued, Dec 2014 or later forwards. CCOs trade w/ 3 yr, 8 yr or no invalidation risk. Pricing is fixed or indexed.

Bundled Carbon Compliance Instrument

Bundled allowance and offsets product typically 92% / 8% split. Trades OTC under bilateral contracts. Pricing is fixed or indexed.

* QCAs are deliverable under the ICE contract
Current Price Spreads

Note: prices are indicative based on current market conditions and are subject to change.
Date: 11/16/2014

- Dec ’14 V14 California Carbon Allowance (CCA)
  - $12.16

- Dec ’14 CCO (3), Buyer wears three years invalidation risk
  - $10.75

- Dec ’14 “Golden” CCO, Seller wears invalidation risk
  - $9.35

- Prompt delivery (Spot) CCO(8)
  - $9.00

Evolution Markets Inc. – Proprietary & Confidential
Auction – Highlights

**Market Commentary:**

- **Total Current Vintage CA-QC allowances sold** at auction: *144,458,886 vs. 2013 Capped Emissions of 144,999,976 tons.* Prices have rallied since the last auction. **Estimated 2015 price floor:** $12.11/ton USD. V14 Dec’14 range bound between $11.66-$12.55 in 2014.

- Analysts report the market is long compliance instruments. **Forecasts predict a shortage 2018 or later.** Prospective bullish signals for the market include a post-2020 mandate, nuclear shutdown (Mt. Diablo), sustained low hydro electric conditions in CA.

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<td><strong>CA Nov 2012</strong></td>
<td>23,126,110 (100% sold)</td>
<td>39,450,000 (14% sold)</td>
<td>$10.00</td>
<td>$10.09</td>
<td>1.06*</td>
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<td>12,924,822 (100% sold)</td>
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<td>14,522,048 (100% sold)</td>
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<td><strong>CA Aug 2013</strong></td>
<td>14,522,048 (100% sold)</td>
<td>9,560,000 (100% sold)</td>
<td>$10.71</td>
<td>$12.22</td>
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<td>16,614,526 (100% sold)</td>
<td>9,560,000 (100% sold)</td>
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<td><strong>QC Dec 2013</strong></td>
<td>2,971,676 (34% sold)</td>
<td>6,319,000 (27% sold)</td>
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<td><strong>CA Feb 2014</strong></td>
<td>19,538,695 (100% sold)</td>
<td>9,260,000 (100% sold)</td>
<td>$11.34</td>
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<td>1,049,111 (99% sold)</td>
<td>1,527,000 (84% sold)</td>
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<td>16,947,080 (100% sold)</td>
<td>9,260,000 (44% sold)</td>
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<td><strong>QC May 2014</strong></td>
<td>1,049,111 (100% sold)</td>
<td>1,527,000 (85% sold)</td>
<td>$11.39 CAD</td>
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<td><strong>QC Aug 2014</strong></td>
<td>1,049,111 (66% sold)</td>
<td>1,527,000 (95% sold)</td>
<td>$11.39 CAD</td>
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<td><strong>JOINT Nov 2014</strong></td>
<td>23,070,987 (n/a)</td>
<td>10,787,000 (n/a)</td>
<td>$11.34 USD</td>
<td>$11.39 CAD</td>
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ICE V13-14 CCA, Dec Delivery

Source: Intercontinental Exchange
OTC CCA vs. CCO Settles

Source: Evolution Markets, Inc.
Historical Offset-Allowance Spread in EU

**EUA & CER: Price Action**

Historical Average EUA/CER Spread: 29%* (2008-2012)

*past 6 months of the EU-ETS the spread between the EUA-CER has widened considerably due to the Euro zone economic crisis. Not accounting for the last 6 months of 2012, the spread is 24%
Deal Structures

Standard Commercial Terms by Deal

• Plain Vanilla Spot or Forward Contract
  – *Terms include Quantity, Purchase Price, Product Definition, Settlement, i.e. Delivery & Payment*

  – *Product Type & Definition:* Mine Methane Capture CCO w/ three(3) or eight (8) year invalidation risk

  – *Invalidation risk:* typically buyer’s require seller’s to pay for and perform the conversion from a CCO(8) to a CCO(3)
    • MMC project owners can perform a verification of a subsequent reporting period with a different verifier within three (3) years of the last project’s issuance in order to reduce the invalidation risk from eight (8) to three (3) years [for prior-issued CCOs]

  – *Purchase Price:* negotiated deal-to-deal; some buyer’s pay X% of the Purchase Price at CCO(8) delivery and Y% of the Purchase Price upon conversion to CCO(3); other’s 100% of the Purchase Price at delivery
    • *Pricing could be fixed or indexed, i.e. indexes might be Seller-Guaranteed Offset a.k.a Golden CCO or the CCA, i.e. Auction Clearing Price or ICE-cleared futures*
Deal Structures (cont’d)

Standard Commercial Terms by Deal

• Plain Vanilla Spot or Forward Contract
  – *Terms include Quantity, Purchase Price, Product Definition, Settlement, i.e. Delivery & Payment*

  – *Delivery*: projects with no balance sheet, i.e. non-investment grade, will sell Unit Contingent (UC). UC delivery is non-firm, non-guaranteed meaning seller performs in operating the project and the buyer is obligated to purchase the CCO output
    • In many cases, buyer’s will request the seller to cause delivery (issuance by ARB) of the Product directly into their CITSS account

  – *Payment*: due upon Delivery of the Product into the buyer’s CITSS account

TALK TO YOUR BROKER ABOUT WHAT COMMERCIAL TERMS AND PRICE ARE CONSIDERED “IN MARKET”
**Brokered Trades**

**Access:** Broker assisted trades enables participant to gain access and insight into the markets, including ideas on effective price risk management, structured financing trades and other strategies maximizing environmental asset value.

**Full Product Coverage:** ICE-cleared allowance futures, options, spreads, and bilateral offset and allowance structured products for California, Quebec, RGGI and other emerging carbon programs.

**Price Transparency:** increased exposure to market pricing and transaction opportunities. Brokers communicate with all market participants and therefore provide price discovery and liquidity in the market.

**Competitive Trade Execution:** When executing via broker seller’s increase their exposure to counterparties vs. trading directly with 1-2 enable parties OTC which limits price discovery. Why sell to 1-2 parties when you can get competitive pricing from the broader market?

**Anonymity (for exchange-cleared deal):** Brokers are used to handle larger “block trades.” For example, 25 contracts (25,000 MT) is typically traded electronically on the ICE. A party may enter the market and want to purchase 1,000 contract (1 million MT). Putting a bid 1,000 contracts on the benchmark Dec ‘14 V14 CCA contract on ICE in a thin market will discourage sellers to sell competitively. The buyer can use an OTC broker to find a seller that is willing to sell the size. The trade is put together OTC by the broker and then given up to the parties’ FCMs for clearing.

**Neutral:** Introductory Brokers (IBs) are market neutral. We do not take principal positions in the market and therefore, do not trade a book which could impact the price we’re providing to the market.
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NOTE: November 4th ARB released 2013 emission data from capped sectors. 2008-2013 emissions trends show declining emissions largely due to the recession, but there are other reasons. 2013 capped emissions in CA amounted to 145M tons. The 2013 cap is 163 million – market is oversupplied compliance instruments.

Macro-economic
• Electrical load and industrial growth in CA → the state’s economic recovery is picking up

Power
• Annual hydro power variability – California declared a drought emergency which means low hydro power/higher fossil generation, yielding higher CCA demand
• Record renewable energy generation in ’13; escalating RPS (33% by 2020)

Transportation
• Added to cap in 2015 -- GHG policies such as clean car standards and LCFS dampening gasoline demand and emissions
• Fuels are 100% short; comprise approx. 160 million tons, or 40%, of emissions cap in 2015
Offset Supply

- Current offset utilization rate is below 8% allowable limit; we expect demand to pick up in 2015 as regulated approach the first compliance period deadline (November 2015)
- 5 project types approved by ARB to date (MMC, ODS, Livestock, Urban Forestry, Forestry)
- Currently approx. 12.2 million tons issued vs. forecasted annual demand of 12 million tons
- **ARB issued a Final Determination to Invalidate 89k of 4.3 million ODS credits under investigation**

Linkage with other Programs

- Quebec-CA linked January 1, 2014 making compliance instruments between the program fungible
- Quebec has a more stringent reduction target than CA and less abatement opportunity due to predominantly hydro power
- Section 111(d) of The Clean Air Act: EPA proposal may lead to additional U.S. States joining CA & Quebec, RGGI
Carbon Price Drivers: Technical & Legal

**Hedging Behavior**
- Power generators buy carbon when selling power; mismatched timing of supply and demand, some argue, could lead to short term price spikes albeit they would be limited given the oversupply
- Utility procurement restrictions adversely impacting liquidity
- Fuels have a large short to cover; we’re starting to see fuel hedging in the V15 Q1 ICE CCA futures contract

**Structural/Regulatory**
- Price floor + 5% escalator and CPI provide price support
- Holding limits adversely impacting liquidity
- High level of free allocations, flexibility to comply, i.e. use ‘V14 against ‘13 emission obligation and some industrials are permitted to use V15 against CP1 obligations
- Resource shuffling “safe-harbor provisions” driving down importer power emissions

**Legal**
- All environmental markets are ripe for legal challenge
- Auction lawsuit challenge -- look out for results in 1H 2015