California’s compliance times

14th annual EPA LMOP Conference
Baltimore, Md
January 19, 2011

Olga Chistyakova
Point Carbon: a Market Intelligence Provider

- Leading provider of News, Analysis and Advisory services to global energy and carbon markets

- 180+ employees. Oslo (HQ), London, Kiev, Tokyo, Washington DC

- More than 15,000 subscribers in 150 domains

- News
- Conferences
- Training courses

- Advisory services
- Trading Analytics & Research
- Comprehensive data on carbon and energy markets
Global carbon market growth

Expansion, then retrenchment

Annual transaction volume in global greenhouse gas emission markets, 2003-10.

Source: Point Carbon
### Table 3: 2009 US offset market volumes and values

<table>
<thead>
<tr>
<th></th>
<th>Volumes (Mt CO$_2$e)</th>
<th>Value ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exchange based</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCX CFIs</td>
<td>6.4</td>
<td>$5.8</td>
</tr>
<tr>
<td>CAR</td>
<td>0.8</td>
<td>$4.0</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>7.2</td>
<td>$9.8</td>
</tr>
<tr>
<td><strong>OTC and bilateral markets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAR</td>
<td>7.2</td>
<td>$48.2</td>
</tr>
<tr>
<td>VCS</td>
<td>2.1</td>
<td>$9.7</td>
</tr>
<tr>
<td>ACR</td>
<td>1.8</td>
<td>$3.5</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>1.1</td>
<td>$2.4</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>12.2</td>
<td>$63.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19.4</strong></td>
<td><strong>$73.6</strong></td>
</tr>
</tbody>
</table>

Sources: Carbon Project Manager North America, CCX, CCFE

- Low volumes and low prices
- CAR was the largest segment of the market
- Pre-compliance overall made up close to 2/3 of the traded US Market
- CAR was pre-compliance driven
California offsets: the basics

- 2012-2020: 8% of entity’s emissions per year
  - 214 million tons CO2e from US-based projects
  - recommends Mexico (non-ODS), Canada for later
- 4 domestic project types
  - U.S. ozone depleting substances
  - Urban forest (forest buffer account)
  - U.S. forest (creation of forest buffer account)
  - Livestock manure (digesters)
- Potential international sources: Sectoral credits (TBD)
  - Requires approval by ARB
  - REDD by 2015, first sectors from existing partnerships with Acre, Brazil & Chiapas, Mexico
  - 20% of 214 Mt in phase 1 and 2, 40% in phase 3
- Projects start date: Jan 1, 2007 (may differ for non-ARB issued credits)
California offsets: early action

- Jan 1, 2005 - Dec 31, 2014
- Project start date: prior to Jan 1, 2012
- 4 project types from U.S. based projected
  - U.S. ozone depleting substances (CAR Ver. 1.0)
  - Urban forest (forest buffer account) (CAR Ver. 1.0-1.1)
  - U.S. forest (CAR 2.1 or 3.0-3.2)
  - Livestock manure (digesters) (CAR Ver 1.0-3.0)
NA offset price changes in 2010

CCA/CRT spread $3.50/t

Prices shown represent average bid/offer and do not imply transactions.
Who is buying US offsets?

- Emitters, 25%
- Carbon aggregators & project developers, 39%
- Liquidity Providers, 30%
- Retail Buyers, 6%

Source: Point Carbon Survey

Emitters (utilities, industrials) have yet to fully enter the market
Issued CRTs to date: 10.3 Mt
Issued CA eligible CRTs: 2.8 Mt

- Coal Mine Methane: 764,358
- Forestry: 1,735,436
- Landfill Gas: 25,931
- Livestock methane: 1,735,436
- Ozone Depleting Substances: 948,659 US-sourced
- Nitric Acid N2O: 3,513,671
- 186,289
2005 – 2014 CRT Supply

Total: 27 million CRTs
(significant ODS supply potential untapped)
CA strategic reserve tightens cap post-2015
## Fair Price Assessment: California

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$10</td>
<td>$11</td>
<td>$11</td>
<td>$13</td>
<td>$19</td>
<td>$30</td>
<td>$47</td>
<td>$64</td>
<td>$82</td>
</tr>
</tbody>
</table>
WCI participants

Market participants
Round 1 (2012 start)
- British Columbia (BC)
- California (CA)
- New Mexico (NM)
- Ontario (ON)
- Quebec (QC)

Round 2 (2015 start)
- Oregon (OR)
- Washington (WA)
- Manitoba (MB)
- Montana (MT)

Other WCI participants:
- Arizona (AZ)
- Utah (UT)
Conclusions

• CRT-based offset supply not sufficient
• Additional protocols to be announced in February will aim to provide necessary supply
• Voluntary markets can provide carbon revenue at $1.50-$3.00/t
• Allowance price to range between $10-82 from 2012-2020
  • Offset prices to create trade at a spread
Thank You!

Olga.chistyakova@thomsonreuters.com
202-289-3930 ext. 269
On behalf of
Molly Peters-Stanley
Ecosystem Marketplace

+1-202-298-3005
mpeters-stanley@ecosystemmarketplace.com
Non pre-compliance, LFG credits purchases are King

U.S. leads in pre-compliance offset purchases

Discounting for Pre-compliance, US leads in LFG credit purchases

Customer Location, % of 10.2 MtCO2

- US: 68%
- EU: 29%
- Other: 1%
- AU / NZ: 1%
- Canada: 1%

Discounting for Pre-compliance, US leads in LFG credit purchases

Projected Market Growth for the Voluntary Carbon Markets, according to Participants