Cross Border Opportunities in China and India

Nicholas Parker
Executive Chairman
Cleantech Group, LLC
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- Indian carmaker Tata to manufacture in NY
- Second time’s a charm for STR Holdings, Inc.

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- October 20, 2009 Indian makes it work in St. Louis
- October 22, 2009 STR Holdings, Inc.

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**CLEANTECH** encompasses knowledge-based technology products/services that:

- Provide superior performance at lower costs
- Greatly reduce or eliminate negative ecological impact
- Improve the productive and responsible use of natural resources

<table>
<thead>
<tr>
<th>Ubiquitous Global Applications</th>
</tr>
</thead>
</table>

**ENERGY**: Includes Energy Generation, Storage, Infrastructure and Efficiency

**TRANSPORTATION**: Includes vehicles design, fuels and logistics

**WATER**: Includes filtration, purification, water conservation and wastewater treatment

**AIR & ENVIRONMENT**: Includes remediation, emission control, trading and offsets

**MATERIALS**: Includes environmental friendly nanotech, biotech, chemical materials

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**MANUFACTURING/INDUSTRIAL**: Includes monitoring/control appliance and smart production industries.

**AGRICULTURE**: Includes land management, natural pesticides, natural fertilizers, irrigation,

**RECYCLING & WASTE**: Includes various recycling services and waste treatment services.
The Emerging Global Cleantech Innovation Ecosystem

New entrants

MAJOR ENTERPRISES

RESEARCHERS/IP CREATORS

ENTREPRENEURS

INVESTORS

CAPITAL PROVIDERS

ADVISORS/SERVICE PROVIDERS

Policy & Economic Development

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Cleantech: The First Global Innovation Revolution

The Present Day: Multiple regional sources of cleantech innovation are rapidly spreading globally.
Cleantech Innovation in China: Making Rapid Progress

- **Cleantech Patents Increasing...**
  Between 2006 and 2008, China had the largest number of original patent filings pertaining to wind, solar, and marine energy, followed by Japan, the US, and Germany.

- **More Cleantech Innovations Emerging...**
  Electric Vehicles is a prime example following on RE technology: BYD, Chery Auto etc. Water, Smart Grid, Agriculture, Building Energy Efficiency, Urban Design, Advanced Logistics are further examples.

- **Foreign Companies Locating Cleantech R&D Facilities in China...**
  In October 2009 US company Applied Materials - the largest solar equipment manufacturer in the world - unveiled the world's largest non-government solar energy R&D center in Xian, China.

- **Overall Ratio of R&D-to-GDP increasing...**
  China is on track to increase the R&D-to-GDP ratio from 1.3 percent in 2005 to 2.5 percent by 2020. Between 1996 and 2003, the ratio rose from 0.6 to 1.3 percent and the industry share of R&D spending has grown from less than 30 percent to approximately 60 percent.

- **Government Focus on Building an Innovation Base...**
  ✓ January 2009 - Chinese Academy of Sciences to set up a platform to support solar innovations and implement an action plan to provide support at each stage of the technology development pipeline.
  ✓ August 2009 - Draft amendment to the Renewable Energy Law to create R&D fund for renewable energy.
  ✓ November 2009 – Group of Singapore SMEs ink deal with authorities in Hangzhou, Zhejiang to set up a $1.5 billion eco-park for innovative clean technology companies.
Private Capital for Cleantech Innovation tops $170B

Innovation Financing in Global Cleantech 2006 - 1Q 2010

Total (2006 - 1Q 2010) = $177B
CAGR (2006-2009) = 17%

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Cleantech now largest U.S. VC Category.

Selected other sectors in 2Q09:
- Biotechnology - 24% share
- Software - 18% share
- Services & Equipment - 17% share

Source: Cleantech Group, PWC MoneyTree Report
Energy efficiency, driven by ICT, eclipses solar

- Information and communication technology (ICT) and smart systems will drive even greater productivity in resource use.
- Boom in energy efficiency that began in 2008 will reach frenzy in 2010, driven by increased policy support.
- Private innovation capital/finance in efficiency could even eclipse solar.
- Quadruple bottom line benefits:
  - Faster to implement than generation
  - Less expensive
  - Net negative in carbon emission
  - Virtually no land or water impact

The last quarter was a record quarter for energy efficiency in venture investment worldwide.

Source: Cleantech Group

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### Cleantech focus within Geographic Regions

What share of the overall VC market does cleantech account for in different regions...

<table>
<thead>
<tr>
<th>Region/Country</th>
<th>Total VC (source in brackets)</th>
<th>Cleantech VC *</th>
<th>Est. Share Cleantech</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>$29.6 B (Venture Source)</td>
<td>$5.64 B</td>
<td>19%</td>
</tr>
<tr>
<td>Global excl. USA</td>
<td>$8.2 B (Venture Source)</td>
<td>$2.24 B</td>
<td>27%</td>
</tr>
<tr>
<td>USA</td>
<td>$21.4 B (Venture Source)</td>
<td>$3.54 B</td>
<td>17%</td>
</tr>
<tr>
<td>Europe excl. Israel</td>
<td>$4.4 B (Venture Source)</td>
<td>$1.71 B</td>
<td>39%</td>
</tr>
<tr>
<td>China</td>
<td>$1.89 B (Venture Source)</td>
<td>$311 M</td>
<td>16%</td>
</tr>
<tr>
<td>India*</td>
<td>$3.82 B (Venture Intelligence)</td>
<td>$315 M</td>
<td>8%</td>
</tr>
</tbody>
</table>

*Investment totals for VC+PE have been used for India due to differences in interpretations of VC/PE deal types from different sources

Lower share in China and India is in part related to demographic and economic growth factors which mean VCs are often more attracted by the opportunities in consumer and services industries in these countries. But Cleantech is catching up.
Cleantech VC Investment in China by Year

Cleantech Venture Capital Investment in China

Total Invested (2006 - 2009) = $1.44 billion
Total Deals (2006 - 2009) = 97

Source: Cleantech Group
## Top 5 Chinese Cleantech VC Deals during 4Q09/1Q10

<table>
<thead>
<tr>
<th>Company</th>
<th>City</th>
<th>Activity</th>
<th>Amount</th>
<th>Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prudent Energy</td>
<td>Beijing</td>
<td>Developer of large-capacity flow batteries.</td>
<td>$22m</td>
<td>Draper Fisher Jurvetson, DT Capital, Northern Light Venture Capital, Sequoia Capital China</td>
</tr>
<tr>
<td>Wuhan HC SemiTek</td>
<td>Wuhan</td>
<td>Developer of LED chips and materials.</td>
<td>$22m</td>
<td>CXC Capital, IDGVA Partners</td>
</tr>
<tr>
<td>IAT (China) Auto Technology</td>
<td>Beijing</td>
<td>Electric vehicles and associated technology.</td>
<td>$20m</td>
<td>China New Enterprise Investment Co., Ltd, GSR Ventures, Mitsui Ventures</td>
</tr>
<tr>
<td>Jiangsu Joyrun Heavy Industry Machinery</td>
<td>Changzhou</td>
<td>Developer of wind power gear boxes and bearings.</td>
<td>$14.7m</td>
<td>Dojane Capital</td>
</tr>
<tr>
<td>Wuhan Huali Environmental Technology</td>
<td>Wuhan</td>
<td>Developer of bio-degradable plastic materials.</td>
<td>$13.5m</td>
<td>DT Capital Partners</td>
</tr>
</tbody>
</table>
## Top 5 Chinese Cleantech VC Deals in 2009/2010ytd

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<tr>
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<th>Activity</th>
<th>Amount</th>
<th>Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astroenergy</td>
<td>Hangzhou</td>
<td>Producer of single crystalline silicon solar cells.</td>
<td>$50m</td>
<td>Cybernaut (China) Investment, Shanghai Lianhe Investment Co., Ltd</td>
</tr>
<tr>
<td>Yeong Guan Energy</td>
<td>N/A</td>
<td>Supplier of casting components to the wind power generator industry.</td>
<td>$30m</td>
<td>Stic Investments Inc.</td>
</tr>
<tr>
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<td>Beijing</td>
<td>Developer of large-capacity flow batteries.</td>
<td>$22m</td>
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<td>$22m</td>
<td>CXC Capital, IDGVA Partners</td>
</tr>
<tr>
<td>IAT (China) Auto Technology</td>
<td>Beijing</td>
<td>Developer of vehicle design, transmission system and electric vehicles.</td>
<td>$20m</td>
<td>China New Enterprise Investment Co., Ltd, GSR Ventures, Mitsui Ventures</td>
</tr>
</tbody>
</table>
Cleantech VC Investment in India by Year

Total Invested (2006 - 2009) = $795 million
Total Deals (2006 - 2009) = 60

Source: Cleantech Group

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Cleantech VC Investment in India by Quarter

Total Invested (2006 - 1Q 2010) = $805 million
Total Deals (2006 - 1Q 2010) = 63

Source: Cleantech Group
VC Investment more evenly spread across sectors in 2009

Source: Cleantech Group
## Top 4 Indian Cleantech VC Deals during 4Q09/1Q10

<table>
<thead>
<tr>
<th>Company</th>
<th>City</th>
<th>Activity</th>
<th>Amount</th>
<th>Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soham Renewable Energy</td>
<td>Bangalore</td>
<td>Renewable energy developer.</td>
<td>$19m</td>
<td>FE Clean Energy Group</td>
</tr>
<tr>
<td>Azure Power</td>
<td>New Delhi</td>
<td>Designer, distributor, and installer of solar PV systems.</td>
<td>$10m</td>
<td>Foundation Capital, Helion Advisors, IFC</td>
</tr>
<tr>
<td>Concord Enviro Systems</td>
<td>N/A</td>
<td>Environmental engineering company.</td>
<td>$10m</td>
<td>Sage Capital Funds Management</td>
</tr>
<tr>
<td>SunBorne Energy Technologies</td>
<td>Gurgaon (Haryana)</td>
<td>Solar power developer.</td>
<td>$5.2m</td>
<td>General Catalyst Partners</td>
</tr>
<tr>
<td>Company</td>
<td>City</td>
<td>Activity</td>
<td>Amount</td>
<td>Investors</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ramky Enviro Engineers</td>
<td>Hyderabad</td>
<td>Waste disposal for individual industries.</td>
<td>$42m</td>
<td>Infrastructure Leasing &amp; Financial Services Limited (IL&amp;FS)</td>
</tr>
<tr>
<td>Krishidhan Seeds</td>
<td>Jalna</td>
<td>Developer, producer and distributor of hybrid seeds for the farming industry.</td>
<td>$30m</td>
<td>Summit Partners</td>
</tr>
<tr>
<td>Cobol Technologies</td>
<td>N/A</td>
<td>Developer of solar power projects.</td>
<td>$30m</td>
<td>Pangea Capital</td>
</tr>
<tr>
<td>Deeya Energy</td>
<td>Gurgaon</td>
<td>Developer of recyclable flow battery energy storage systems.</td>
<td>$30m</td>
<td>Blue Run Ventures, Draper Fisher Jurvetson, Element Partners, New Enterprise Associates, Technology Partners</td>
</tr>
<tr>
<td>Soham Renewable Energy</td>
<td>Bangalore</td>
<td>Renewable energy developer.</td>
<td>$19m</td>
<td>FE Clean Energy Group</td>
</tr>
</tbody>
</table>
VC Investment: Total Amount vs. Total Amount (PPP*)

Source: Cleantech Group

*purchasing power parity
Record number of deals in 2009: Asia dominates in 2009 ($9.6B). [Europe ($3.9B), North America ($1.8bn)]

Source: Cleantech Group
Cleantech Increases Share of Global M&A

Cleantech more than doubled its share of M&A in 2009

Source: Cleantech Group, OECD/Dealogic
China accounted for 17% of the total M&A amount in 2009, slightly lower than the leading country (U.S., with 22%)
### Top 5 Chinese Cleantech M&A Deals in 2009/2010ytd

<table>
<thead>
<tr>
<th>Target</th>
<th>Buyer</th>
<th>Type</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jiangsu Zhongneng Polysilicon Technology Development</td>
<td>GCL Solar Energy Technology Holdings</td>
<td>Acquisition</td>
<td>Acquisition of supplier of polysilicon and wafers. The deal makes GCL-Poly one of the world’s top suppliers of polysilicon.</td>
<td>$34bn</td>
</tr>
<tr>
<td>GCL Solar Energy Technology Holdings</td>
<td>China Investment Corporation</td>
<td>Minority Stake Transaction</td>
<td>Sovereign wealth fund invests in energy and commodities companies to hedge against inflation.</td>
<td>$710m</td>
</tr>
<tr>
<td>Apollo Precision (unit of GS-Solar)</td>
<td>RBI Holdings</td>
<td>Acquisition</td>
<td>Acquisition of developer of thin-film photovoltaic projects.</td>
<td>$616m</td>
</tr>
<tr>
<td>Chery Auto</td>
<td>Israel Corp.</td>
<td>Joint Venture</td>
<td>Electric Vehicle joint venture.</td>
<td>$500m</td>
</tr>
<tr>
<td>LDK Solar</td>
<td>Jiangxi International Trust and Investment</td>
<td>Minority Stake Transaction</td>
<td>Acquisition of a 15% ownership stake in polysilicon plant from LDK Solar by regional economic development company.</td>
<td>$219m</td>
</tr>
</tbody>
</table>
China dominating globally by number of IPOs

Share of IPOs between China, US, Europe

Source: Cleantech Group

* 2009 up to and including 3Q09
In 2009 for the first time, China/Hong Kong accounted for the largest share of global money raised (69%), well ahead of the U.S. (26%).
# Top 5 Chinese Cleantech IPOs in 2009/2010 YTD

<table>
<thead>
<tr>
<th>Target</th>
<th>Exchange</th>
<th>Date</th>
<th>Amount Raised</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>China Longyuan Electric Power Group Corp</td>
<td>Hong Kong Futures Exchange</td>
<td>4Q09</td>
<td>$2.2bn</td>
<td>Wind</td>
</tr>
<tr>
<td>Chongqing Water Group</td>
<td>Shanghai Stock Exchange</td>
<td>1Q10</td>
<td>$511m</td>
<td>Wastewater Treatment</td>
</tr>
<tr>
<td>Beijing Origin Water Technology</td>
<td>Shenzhen Stock Exchange</td>
<td>2Q10</td>
<td>$370m</td>
<td>Wastewater Treatment</td>
</tr>
<tr>
<td>Narada Power Source</td>
<td>Shenzhen Stock Exchange</td>
<td>2Q10</td>
<td>$301m</td>
<td>Advanced Batteries</td>
</tr>
<tr>
<td>Beijing Water Business Doctor</td>
<td>Shenzhen Stock Exchange</td>
<td>1Q10</td>
<td>$213m</td>
<td>Wastewater Treatment</td>
</tr>
</tbody>
</table>
Energy efficiency (especially LEDs), transportation, batteries and new materials are becoming the leading VC sectors, overtaking previous favorites which were solar and wind.

Investment in 1Q 2010 was three times higher than in 1Q 2009, suggesting more confidence from investors as the market recovers from the economic downturn.

Fifteen M&A transactions were tracked for the first quarter in China totaling about $900 million, which was down marginally from 4Q09 but almost as twice as high as 1Q09.

Cleantech IPOs in China are expected to account for the majority of IPO transactions globally in 2010 if current trends persist. Seven of the eight IPOs in 1Q 2010 were listed on the Mid-to-Small company board on Shenzhen Stock Exchange which was launched last year (and is commonly known as ChiNext).

Several municipal cities announced their subsidy plans to encourage the application of renewable energies, especially solar within cities.

The 12th Five-Year-Plan (FYP) is set to be announced soon with new energy, smart grid, alternative energy transportation and a low carbon economy the key themes.

Alternative energy vehicles and contract energy management are also two key areas the government has paid attention to recently.

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Building a green recovery: USD521bn

Asia leads the way with almost 2/3rd of green stimulus

Source: HSBC estimates, government websites, others
As of Dec 09 China has so far accounted for $51bn of the $59bn spent by governments worldwide.

The possibility of stimulus spending commitments being withdrawn in 2010 and 2011 are more likely in debt-ridden western countries.
Investing in environmental infrastructure

- Energy Efficiency: 64%
- Renewable: 8%
- Water: 16%
- Other Low Carbon: 13%
- Buildings: 16%
  - Lo C Vech: 4%
  - Rail: 25%
  - Grid: 18%
From stimulus to austerity? Not yet

• China: Environmental spending in 2010 fiscal budget up 20%

• India: New coal levy introduced raising USD550mn a year for a National Clean Energy Fund

• UK: World’s first Green Investment Bank announced capitalised with USD1bn of asset sales

• USA: 2011 budget request increases environment and climate measures 46%, some USD21bn more than 2010
Clean Infrastructure - $40T Global Opportunity

Total projected cumulative infrastructure spending 2005–2030: $41 trillion

- **Middle East**: $0.9T, 16% of total
- **Africa**: $1.1T, 1% of total
- **U.S./Canada**: $6.5T, 17% of total
- **South America/Latin America**: $7.4T, 12% of total
- **Europe**: $9.1T, 20% of total
- **Asia/Oceania**: $15.8T, 40% of total

Source: Booz Allen Hamilton, Global Infrastructure Partners, World Energy Outlook, Organisation for Economic Co-operation and Development (OECD), Boeing, Drewry Shipping Consultants, U.S. Department of Transportation

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Ecological Overshoot: India in Context

Ecological Footprint

- Territory size shows the proportion of the worldwide ecological footprint which is made there.

Water Depletion

- Territory size shows the proportion of all water used that is more than 10% of the renewable internal freshwater resources of that territory.

Increase in Fuel Use

- Territory size shows the proportion of worldwide increases in fuel use (1980-2001) that occurred there.

Mineral Depletion

- Territory size shows the proportion of all annual mineral depletion that occurred there.

Source: Worldmapper
Issues and Topics: IFC Workshop

- Capital Availability
  - Debt
  - Equity
- Cross Border Capacity
- Scaling Innovation: Partners
  - Projects
  - Products
- Role of MDBs: Cleantech for All, LDCs
- (Limited) Role of Concessional Financing
- Building Relationships
Thanks!

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