



Generation of Emission Credits in the Magnesium Sector

4th Annual Global Magnesium Industry Climate Protection Workshop
Warsaw, Poland

18 May 2008

Climate Change Capital[®] 



Corporate Overview

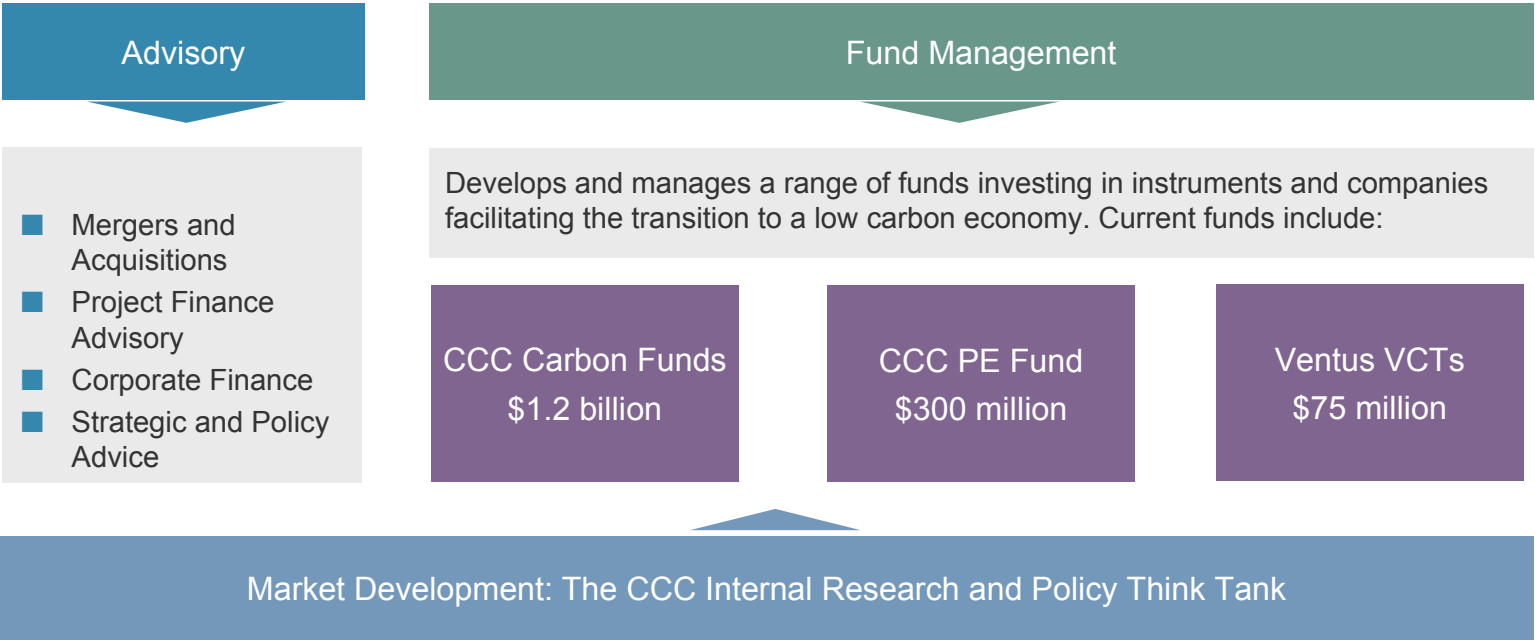
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Climate Change Capital

Climate Change Capital (“CCC”) is a leading Investment banking group specialising in the investment opportunities created by a low carbon economy. CCC advises and invests in companies who recognise that combating global warming is both a necessity and an economic opportunity.

CCC is the leader in the provision of financial and market-related policy advisory services and financing for clean power, clean technology, clean fuels and carbon markets. With 140 employees, CCC is headquartered in London with dedicated teams focusing on China, Spain, North America, India and Latin America.

Through the combined talents of advisors, finance professionals, environmentalists and access to a significant capital base, CCC is perfectly placed to help its clients adapt to, and profit from, a vast new energy economy.



The Climate Change Capital Carbon Funds

CCC manages the world's largest private sector carbon fund and has over \$1.2 billion under management for investment in companies and projects that generate emission reduction credits. Investors in the CCC funds include two of the world's largest pension funds, a leading UK utility company and a global emerging markets bank.

- The funds act as long term partners with host countries to ensure the financed projects meet the development needs and priorities of those countries; making sure projects achieve the underlying technology transfer rational of the Clean Development Mechanism
- The funds work with proven technology providers to develop carbon assets from a range of methodologies including: landfill gas, energy efficiency, destruction of industrial gases, agricultural waste, renewable energy and agricultural waste.
- CCC has built a substantial portfolio of emission reduction credits in areas including landfill methane gas capture, coal mine methane utilisation, industrial gas destruction, renewable energy, waste heat recovery and Land Use, Land Use Change and Forestry (LULUCF).
- In September 2006, CCC announced the largest private sector carbon finance transaction. Working with a Chinese chemical company., CCC structured a deal to destroy several tens of millions of tonnes of carbon dioxide equivalent over a six year period.

Carbon Finance: The CCC Advantage

Significant capital, carbon expertise and emerging markets focus: combining global “carbon financing” competence with deep local relationships and knowledge

- **Financial strength, savvy and innovation**
 - Equity and capital risk management and inventive structures

- **Carbon development and management expertise**
 - Maximise quantity of CERs, volume of tonnes, produced through input on design and methodologies
 - Maximise value of CER portfolio across a stream of assets through our portfolio management / hedging capabilities – variable pricing

- **Business leadership teamed with local and global relationships**
 - Help build winning companies through active oversight / governance
 - Mutual exploration of complementary business / financing opportunities beyond pure carbon
 - Access to global financial partners interested in underlying debt and equity

The Carbon Finance group has expertise in project and carbon finance, international law, policy and private equity investments. Its experience ranges from large investment banks to small project development companies; environmental ministries to international law firms.



Global Carbon Markets

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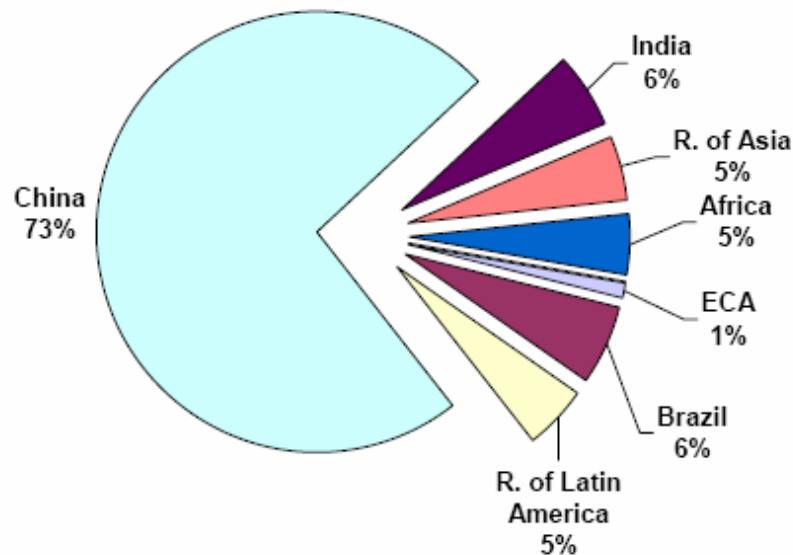
Growth of Regulatory Market: EU ETS & CDM

The global carbon market is the most visible result of regulatory efforts to mitigate climate change.

- Regulation constraining carbon emissions has spawned an emerging market valued at \$64 billion in 2007, roughly double the market size of 2006 and six times the market size of 2005
- The EU Emissions Trading Scheme (EU ETS) has been successful in its mission of reducing emissions through internal abatement and stimulating emissions abroad and accounted for approximately \$50 billion of 2007 value
- Buyers also showed strong appetite for project based emissions, largely under the Clean Development Mechanism (CDM), which accounted for \$13 billion of 2007 market value
- While the voluntary market is becoming increasingly robust (\$330 million) it is still relatively small compared to regulated markets

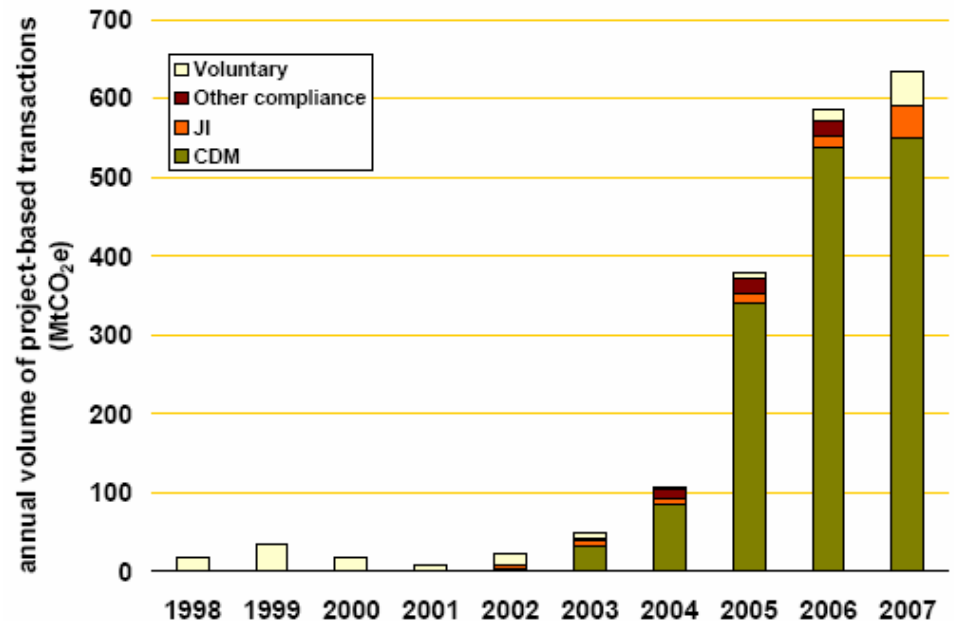
Location of CDM Projects (2007)

Share of volume supplied



Project-Based Emission Reduction Transactions

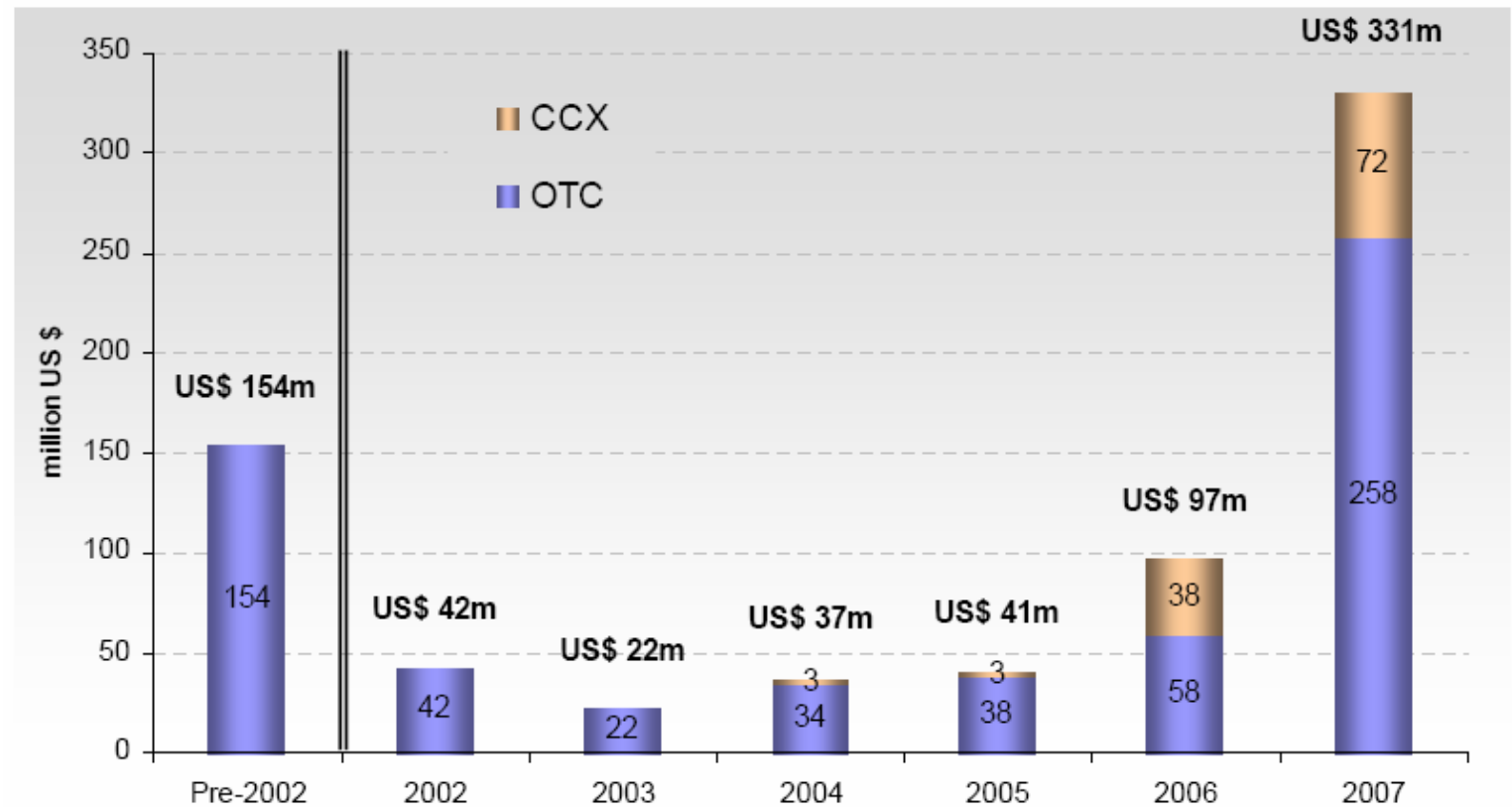
Annual Volumes [MtCO₂e]



Voluntary Markets

The scale and innovation in the voluntary markets has increased dramatically in the last two years

- In 2007, approximately 65 million tCO₂e were transacted at a value of more than \$330 million
- This represents more than 3x growth over 2006 and almost 10x growth over 2005
- Offset credits are being generated by a wide variety of project types, with the most dominant being renewable energy, methane destruction and forestry projects
- The highest prices are being paid for projects with strong quality and verifiability attributes



Motivations for Buyers

In the absence of a regulatory requirement to reduce emissions, why is there a \$250 million voluntary carbon marketplace?

- Verified Emissions Reductions (VERs) have been trading for a decade
- Many companies that want to reduce their GHG emissions are buying credits from external projects as they provide a more cost effective means to reduce or abate a ton of CO₂e

Buyers have different motivations to procure carbon credits

- Desire to be carbon neutral or meet corporate GHG commitments (HSBC, Yahoo!, Google)
- Possible early-action compliance in preparation for future regulatory regimes
- Companies who have a point-of-view and are looking for “cheap” tons that might be sold as offsets under a cap and trade system

Mapping the US Regional Initiatives

More than half of US States representing 60% of GDP have greenhouse gas reduction targets. These include Regional Greenhouse Gas Initiative (RGGI), Western Climate Initiative (WCI) and the Midwestern Regional Greenhouse Gas Reduction Accord (MGA)

WCI (15% below 2005 levels by 2015)

- **USA:**
 1. Arizona
 2. California*
 3. New Mexico
 4. Oregon
 5. Utah
 6. Washington
 7. Montana
 8. Nevada**
 9. Idaho**
 10. Colorado**
 11. Wyoming**

- **Canada:**
 1. British Columbia
 2. Manitoba
 3. Quebec

* California is also pursuing more stringent targets and will not be subject to pre-emption by the WCI scheme
 ** Observers

RGGI (10% below 2009 levels by 2019)

- **USA:**
 1. Connecticut
 2. Delaware
 3. Maine
 4. New Hampshire
 5. New Jersey
 6. New York
 7. Vermont
 8. Massachusetts
 9. Rhode Island
 10. Maryland
 11. Pennsylvania*

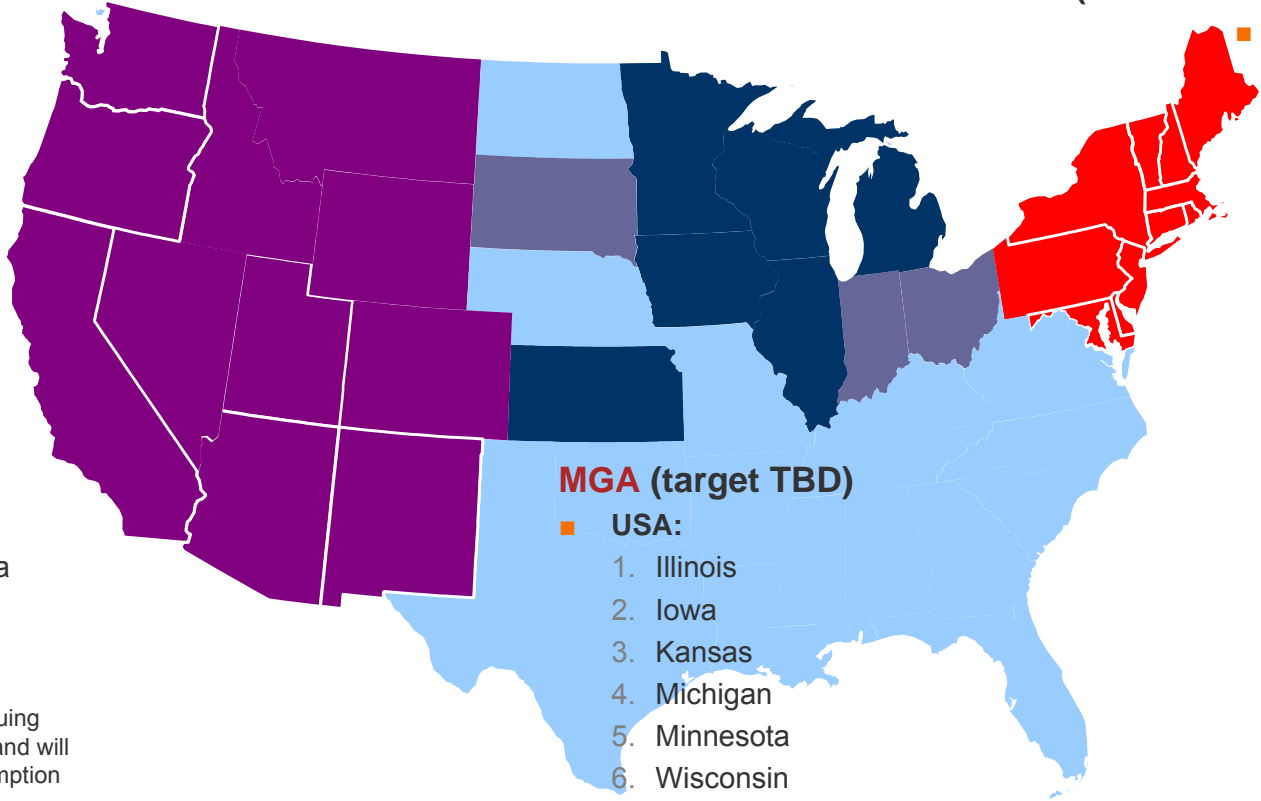
* Observer

MGA (target TBD)

- **USA:**
 1. Illinois
 2. Iowa
 3. Kansas
 4. Michigan
 5. Minnesota
 6. Wisconsin
 7. Indiana*
 8. Ohio*
 9. South Dakota*

- **Canada:**
 1. Manitoba

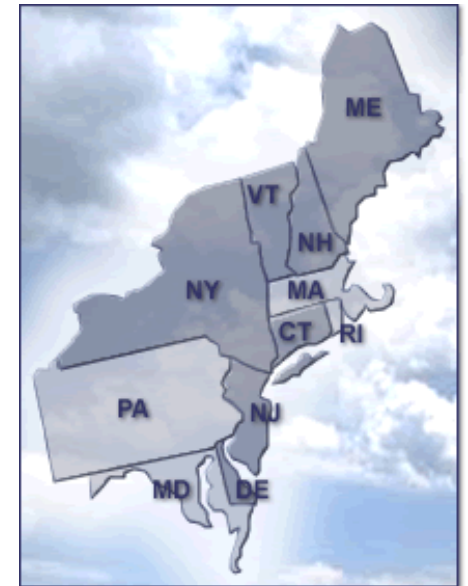
* Observers



The Role of Offsets in US Cap & Trade Systems

RGGI (Regional Greenhouse Gas Initiative)

- Starts January 2009 in 10 northeast states
- CO2 allowances will be issued by RGGI to utilities, who can meet their regulatory obligation by directly reducing emissions, buying allowances from other utilities or procuring project-based offset credits that meet RGGI protocol
- Eligible offset types include:
 - ▶ Landfill gas (methane) capture and destruction
 - ▶ Methane capture from farming operations
 - ▶ End-use efficiency for oil & gas
 - ▶ Afforestation and reforestation
 - ▶ SF6 capture and recycling
- There is very good potential to expand offset eligibility
- Offsets can be imported from a non-RGGI jurisdiction state (as long as a Memorandum of Understanding exists)



US Federal Cap & Trade (and California)

- All three presidential candidates support cap & trade systems to reduce GHG emissions
- Lieberman-Warner bill slated to be debated (and possible voted on) week of June 2nd
 - ▶ Creates a system that will be short approximately 1 billion tons per annum at outset
 - ▶ Allows for capped entities to use domestic offsets to meet 15% of need (Int'l offsets 5%)
- California passed AB32 legislation mandating emissions reduction, will likely include offset based mechanisms (draft guidance to be published at end of June)



Opportunity in the Magnesium Sector

What does this all mean?

The opportunity for magnesium companies

- If you have a project – whether it be in the United States or elsewhere – that reduces GHG emissions, you can monetize these reductions
- These projects are “carbon assets” that bring in extra revenue annually through 2012...
...and very likely beyond
- However, these projects must follow a specific baseline and monitoring protocol - an absolutely necessity to creating a credible carbon asset

CCC Experience in this market

- CCC drafted the first protocol for the magnesium sector, which was approved by the UN CDM Executive Board (the UN regulatory authority that oversees the creation of carbon offsets under the Kyoto Protocol)
- CCC has partnered with Meridian Magnesium to implement this protocol on a voluntary basis and purchase VERs from their plants in the US and Canada
- Meridian is the first die caster in the US to completely eliminate the use of SF6 as a cover gas
- The project is being implemented with the full level of detail and rigor required under the UN CDM process – including annual 3rd party validation and verification
- Although the use of 3M Novec-612 is more expensive than SF6, the sale of carbon credits turns the project from a multi-million dollar loss into a multi-million dollar gain (not to mention the significant environmental benefits as well)
- CCC is now working with regulators in the US to ensure acceptance of these credits in future regulatory regimes (which would likely bring in an even higher price)

Replicating the opportunity at other companies

CCC has been very pleased with its success thus far in the magnesium sector

- To date, the Meridian project has been successfully implemented, the methodology has been approved by the UN CDM Executive Board and validation is in progress
- CCC would like to invest in additional magnesium projects with the goal of expanding our VER portfolio in the US
- CCC can provide capital to pay for the equipment switch, gas trials and other upfront costs.
- Additionally, the annual generation and sale of carbon credits to CCC will more than offset the higher cost of alternative cover gas
- CCC also bring the technical expertise (having written the only approved methodology) and policy insights and relationships that may lead to increased future value
- Magnesium companies can greatly reduce risk through avoiding upfront costs, in addition to defraying on-going operational costs

It may also prove useful to bundle a number of smaller projects

- In some instances, companies use too little SF6 to justify the transaction costs associated with carbon projects (i.e., annual 3rd party verification and listing of offsets on an approved registry)
- If this is the case, CCC is interested in bundling smaller projects (perhaps those less than 50,000 tCO₂e/year) together to create a single transaction and an economy of scale
- Several models could be used. For example, one entity might be appointed to disburse carbon revenues to individual companies making the switch from SF6

CCC is ready to start working with you...

...and help every magnesium company eliminate the use of SF6

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Appendix

The Climate Change Capital Carbon Funds: Investments in China



€350 million already invested:

- Coal mine methane
- HFC-23 Abatement
- Hydro-power generation
- Waste gas power generation in steel
- Landfill gas power generation
- Waste heat power generation in cement
- Biomass power generation
- Wind power generation

CDM Case Study 1: China Fluoro Technology

The investment will be made by CCC in a large scale HFC 23 reduction project in China and will achieve 23.5 million tonnes of CO₂e CERs over 6 years. The host company is a privately held Chinese company: China Fluoro Technology Co. Ltd, located in Jinan, the capital of Shandong province, the most populated province of PR China.

- CCC worked closely with the project developer for over a year to maximise the GHG abatement potential of the project
- Good example of the value add expertise that CCC can bring to bear using both technical and CDM expertise, abating several million more tonnes of CO₂e than would have been possible otherwise
- This was done by conceiving, designing and paying for a HFC 23 storage system (see pictures) – the project developer wasn't aware this could be done from a technical or methodological perspective
- The storage system is important because the design, construction and installation of the incinerators takes a relatively long time, the storage system enables the capture of the pollutant until such time as the abatement technology comes online
- This isn't a well known concept and CCC put capital at risk to accelerate the abatement of one of world's most potent GHGs



CDM Case Study 2: Zhejiang Juhua Project

The Zhejiang Juhua HFC 23 project deal is the largest ever private sector syndication of a Clean Development Mechanism (CDM) project in China. The project will achieve 29.5 million tonnes of carbon dioxide equivalent CERs over 6 years.

- Thanks to the syndication, the Chinese chemical company Zhejiang Juhua Co Ltd, have the necessary equipment to incinerate the refrigerant gas by-product, HFC 23.
- HFC23 is a green house gas which is 11,700 times more potent in global warming potential than carbon dioxide.
- CCC structured the syndicated deal with assistance from Deutsche Bank who financially guaranteed the underlying payment structure.
- The syndication members include CCC's Carbon Fund 1 and Carbon Fund 2, Centrica, Deutsche Bank, Morgan Stanley Commodities Group, investment funds managed by Och-Ziff Capital Management Group and Stark Investments.

CDM Case Study 3: Shuangliao Wind Farm

CCC will provide vital project financing for the 49.3 MW grid connected Shuangliao Wind Farm project in Shuangliao City, Jilin Province, China. The project will reduce approximately 190, 800 metric tons of CO₂ on an annual basis.

In addition to reducing CO₂ emissions the project will also:

- Assist China in stimulating and accelerating the commercialisation of grid connected renewable energy technologies and markets; providing a direct contribution China's target of generating 10% of electricity from renewables by 2012
- Yield substantial local and public health benefits by annually averting 581.5 tons SO₂, 11.9 tons of CO, 471.4 tons of NO_x and 5.3 tons of mercury
- Generate 105,120 MWh of electricity per year and avert the use of 37 thousand tons of coal per year
- Aid in technology transfer by the use of imported wind turbines from a European manufacturer
- Make use of land unfit for cultivation, located relatively far from residential areas

CDM Case Study 4: Shenzhen Xiaping

Through the purchase of CERs CCC is providing project financing for the collection and utilisation of LFG produced by the Xiaping landfill site in Shenzhen City, Guangdong Province. The collected LFG will be used to produce Compressed Purified Landfill Gas (CPLG) for power generation and avoid 5,741,878 metric tons of CO₂ from 2006 – 2015.

In addition to reducing CO₂e the project will also:

- Significantly reduce health risks, bad odour and potential for explosions
 - Demonstrate the economic benefits of clean technology, promoting better management of landfill gases throughout China
 - Increase capacity building and technology transfer, conserve natural resources and increase employment opportunities in the region
 - Promote the use of upgraded LFG as automobile fuel reducing natural gas consumption and improve the mass transit vehicle system of Shenzhen City
-

Project developer had excellent track record in managing landfills, but limited expertise in landfill gas capture and combustion. CCC brought in world-renowned LFG experts to help the developer design a capture system, which would maximise capture efficiency and therefore increase the number of CERs

CDM Case Study 5: Pingdingshan Coal Group Ltd.

Pingdingshan Coal Group Co. Ltd. (PCG) is located in Henan Province in central China. It operates a total of 31 mineshafts, and produces approximately 32 million tons of coal a year. CCC's Carbon Funds will finance the installation of Chinese-manufactured gas engines and inlet systems specially designed to permit the safe combustion Coal Mine Methane (CMM). The project is expected to remove 6.5m tonnes of CO₂e over 10 years.

In addition to reducing emissions the project will also:

- Contribute to China's sustainable development by transferring newly developed methane oxidation technologies
- Support training and development of PCG staff and encourage increased safety standards at the mines through the participation of foreign engineers and technology experts
- Promote the utilization of an energy resource that is currently wasted by PCG, i.e. the thermal energy produced from the CMM combustion can be substituted for coal boilers
- Reduce pollutants, such as sulphur dioxide and nitrogen oxide, in the atmosphere around the mines
- Encourage employment from the local community to manufacture, install and operate the new equipment.



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