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GHG (Carbon) Management

*Local Waste Perspectives
on an International Market*

presented by Chris Snyder

Overview

- Who is GES
- What is carbon, what is the carbon market
- How carbon offset projects and carbon finance work
- Recent developments in the carbon market
- Offset projects in waste management
- The future



Golder Ecofys Solutions

Golder: Global Environmental and Engineering Services (5,000 +)

Ecofys: European-based, leading edge carbon & energy management services and renewables experience (250 +)

GES – provides carbon management and sustainable energy services to public and private sector clients



What is Carbon

- Short form for Carbon Dioxide equivalents (CO_2e)
- 6 gases that cause a 'greenhouse' effect have different GWPs
- CO_2 is most common (1 GWP), also methane (21 GWP) and N_2O (310 GWP)



The Carbon Market(s)

- Where buyers and sellers of carbon credits meet - {several markets w/o connection}
- Global in nature and growing
 - 1.6 B tonnes CO₂e, \$35 B in 2006
 - 50 % vol. increase for 2007
- Majority in Europe (EU ETS) for compliance
- Project-based (CDM, voluntary)



How Carbon Offset Projects Work

- A project that reduces greenhouse gas (carbon) emissions over a period of time
- Not business as usual {minimum: not required by regulation; more stringent: financial additionality}
- Baseline – what would have happened without the project {need rules to determine, incl. what is project boundary}



How Carbon Offset Projects Work

- Can you measure the emission reduction ?
- Can a third party verify the emission reduction ? {need applicable protocols}
- CDM / JI – project-based carbon credits – strict rules based
- Voluntary market – ‘wild west’ – multiple sets of ‘rules’ – offsetting (corporate, personal)
- No domestic rules yet...

Kyoto 1 – starts 2008, ends 2012 (EU, Japan, Canada?)



How does Carbon Finance work

- Project based generation of carbon credits:
 - Project Boundary; double counting issue
 - Project Baseline – project specific; industry specific; regional
- \$ value of credits generates additional cash flow from a project
- Many options: e.g., sell forward; securitize; hold and sell later/use internally



Carbon finance – example- BP and Edison - \$1 Billion investment

- Petroleum Coke – pyrolyze to generate H₂
 - Burn H₂ in gas turbine – 500 MW electricity
 - CO₂ by pipeline to oil field - sequestration
 - Project Boundary – LARGE – electricity plant + oil field
 - Project Baseline – offset natural gas fuel – approx. 0.5 tonnes CO₂ equivalent per MWh electricity
- Carbon credits: $0.5 \times 500 \times 8,000 \text{ hours/yr.} = 2 \text{ M tonnes CO}_2 \text{ equivalent (ballpark)}$
- Additional cash flow generated from project:
 $2 \text{ M tonnes} \times \$5/\text{tonne} = \$10 \text{ M}$

(5 x higher if in EU, based on current price for compliance credit in EU for 2008-2012)



Climate change – drivers for action

Major Drivers: *Carbon constrained future, energy price & security, fiduciary duty, regulations*

- Domestic – some type of GHG emission management system in near future (Canada and U.S.); Carbon Disclosure Project – asking questions
- Domestic and International – continued strong interest on Renewable Energy
- Voluntary, CDM/JI & Domestic Offset – broad-based demand will drive further supply
- Change in U.S. policy before end of KP 1



Carbon Market – recent developments

- California (2006) – reduce to 1990 levels by 2020, 80 % below by 2050 (Cap and Trade in 2012)
- RGGI – electricity generation – NE States (Cap and Trade – start 2009)
- Other U.S. States
- Major corporations on board (US CAP)

...likely at Federal level in next 3 to 5 years



Carbon Market – recent developments

- Alberta *Specified Emitters Reg.* (Emission Intensity Based) for >100 K t CO₂_e/yr. – option to purchase Alberta-based offset credits
 - B.C. – incorp. carbon value - New Power Call
 - B.C. and Ontario – regulations soon?
 - Federal Green Plan – intensity based with option to purchase domestic offset credits
- beyond tipping point in N.A.



Where are we

- Carbon what
- Carbon why
- Carbon when

Carbon How – Waste Management !



Offset Projects in Waste Mgmt.

- Meets the eligibility requirements for an offset project {not BAU; not required by regulation}
- Need rules and procedures for baseline, monitoring, and 3rd party verification
- No domestic rules and procedures in place yet; Alberta will issue rules shortly



Offset Projects in Waste Mgmt.

- Potential universe: anywhere carbon emissions are reduced compared to *status quo* – look at your value chain
- Looking elsewhere: LFG; organics diversion from landfill; biomass to energy
- Think creatively
- Watch for new regulations that could lower the baseline



Today's forecast

- Short term (1 year) – clarity over offset project rules and domestic market development
- Medium term (1-3 years) – even if Kyoto is out, carbon constrained future remains – other demands for emission reduction credits in the market



Take away

- GHG (carbon) emission reduction is international in trajectory, but local regulations and other drivers strongly affect the local, domestic carbon market
- For waste management, domestic opportunities for offset project credits beyond just LFG



Questions

Services, solutions and innovations in carbon management and sustainable energy

Broad, international experience

Global reach



Kyoto and Canada – yesterday's forecast (June 28, 2004)

From the Liberal Party platform:

- "Developing clean, renewable energy sources"
- "Environmental sustainability by reducing the emissions that threaten the global climate"
- Reaffirmed Canada's commitment to KP

From the Conservative Party platform:

- "Redirect federal spending aimed at fulfilling the terms of the increasingly irrelevant Kyoto Protocol to concrete programs to ensure clean air, water, and land, and to promote energy conservation."



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