

Kyoto and Beyond: Carbon Finance and Energy At The World Bank

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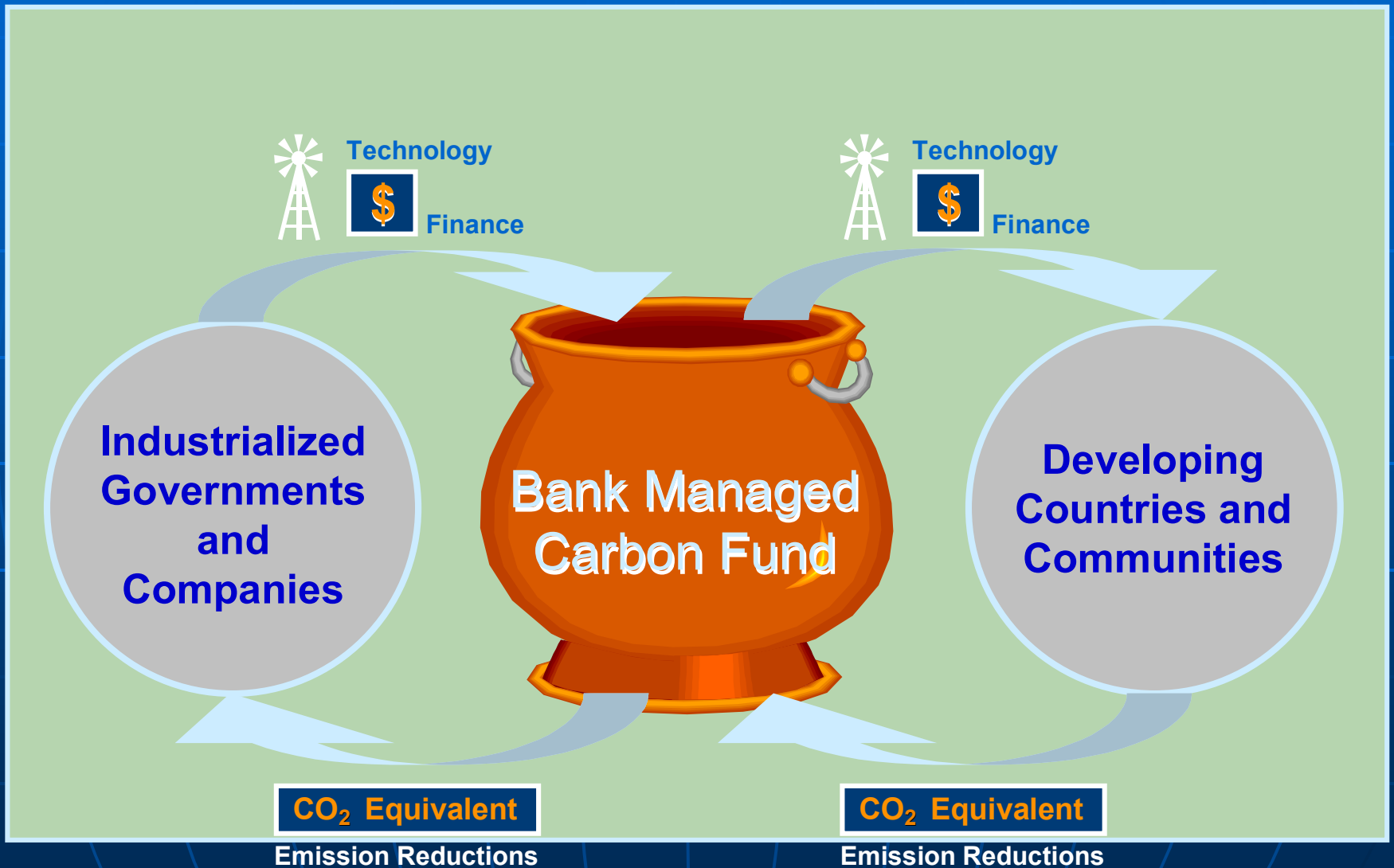
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Carbon Finance and Energy



- World Bank Carbon Finance Business
- Current Key Challenges and Solutions
- How These Deals are Done
- The Role of Carbon Finance and Energy

How Carbon Funds Work



Payment on delivery of emissions reductions. No direct investment in underlying project

Carbon Finance Business: Funding



Prototype Carbon Fund

\$180 m



Community Development Carbon Fund.
Second Tranche opens late 2005

\$129 m
to date



BioCarbon Fund
target \$40 million

\$ 33 m
to date



Netherlands CDM Facility

\$ 180 m



Italian Carbon Fund

\$ 80 m
to date

Netherlands JI
Facility

Netherlands JI Facility (with IFC)

\$ 35 m
\$ 637 m

Just Signed: Spanish and Danish Carbon Funds

~ \$ 230 m

Being Designed for Late 2005 operations: Pan-European Carbon Fund

Carbon Finance Business: Commitments



As of 12/31/04

**ERPAs
(US\$m)**

**Project
Cost
(US\$m)**

**ERs
Contracted
(mTCO2e)**

RE Total

87.7

656

21.1

"New" RE

58.6

309

14.7

Hydro>10MW

29.1

347

6.4

EE

17.1

192

4.6

RE + EE

104.8

848

25.7

CFB Total

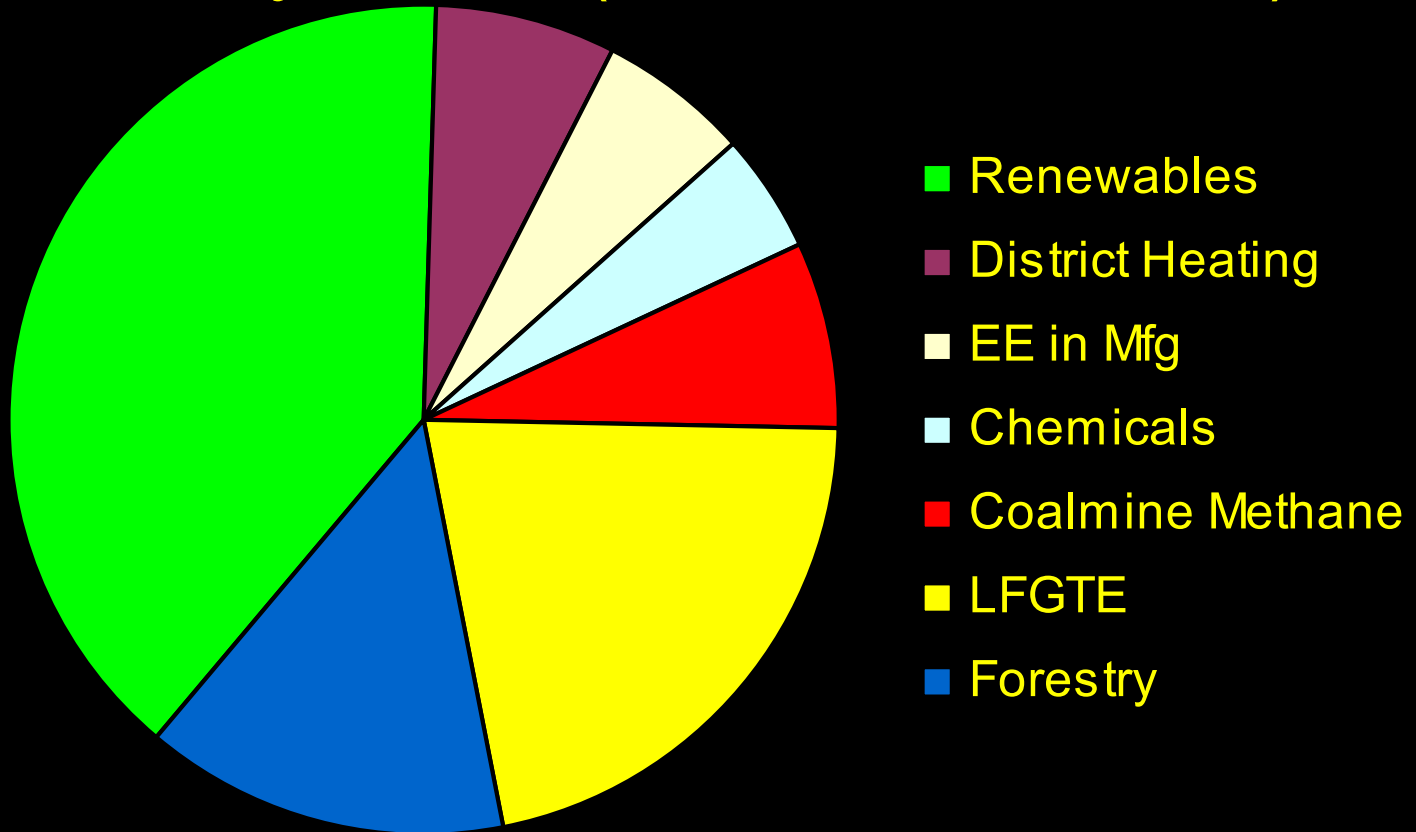
113.1

872

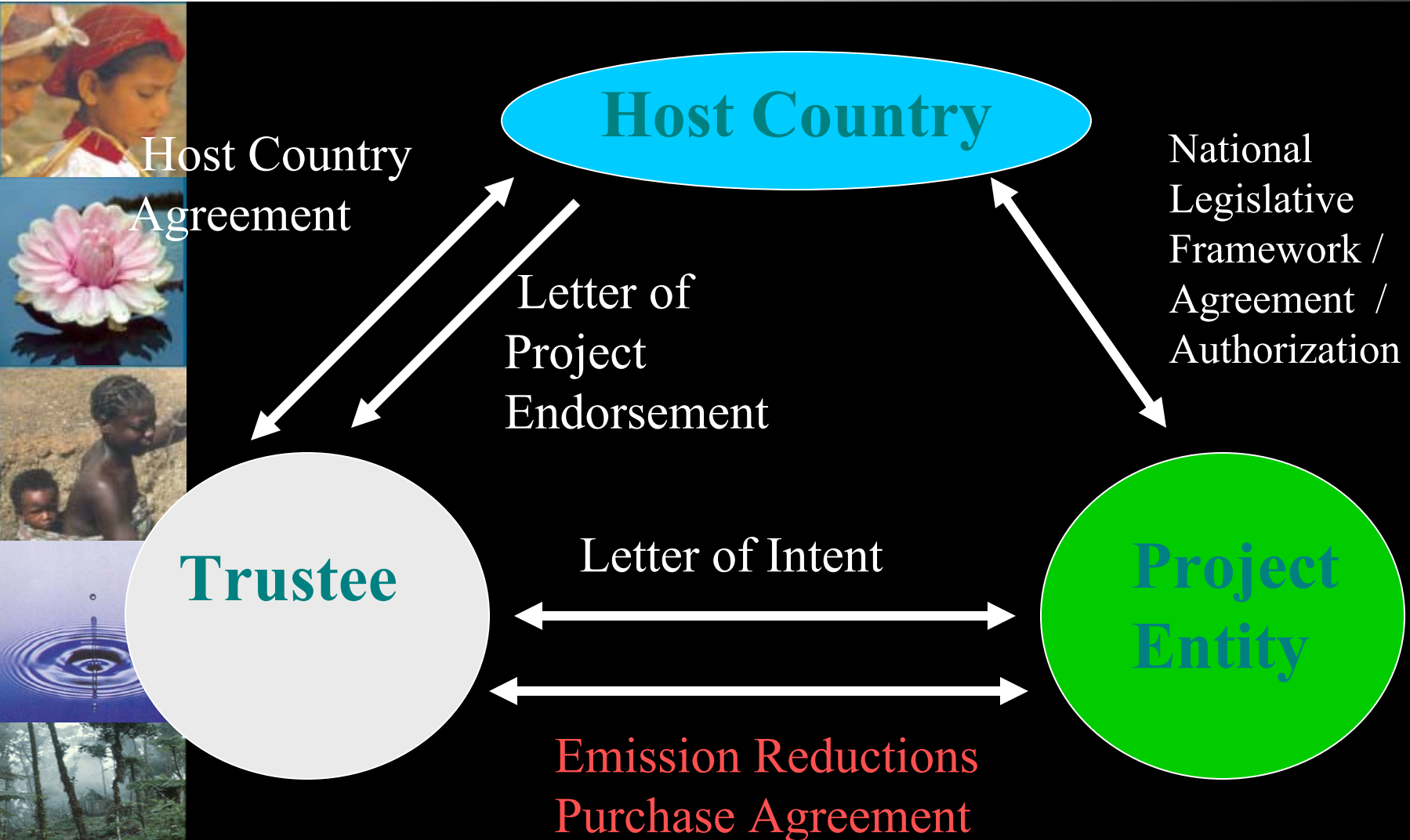
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Carbon Finance Business: Pipeline

ERs by Sector (Total 63.4mtCO₂e)



Legal Agreements for Carbon Finance Projects



A Major Legal Challenge

Carbon Agreements are

- Designed to buy something that does not exist
- From people who may not know what they are selling, or be able to sell it
- Under complex rules that keep changing



Carbon Rights

- Are created under (i) Legislation or (ii) Contracts
- Carbon Rights under legislation usually provide for an authorization to emit a certain amount of greenhouse gases (GHG)
- Carbon Rights under contracts define a GHG reduction against a agreed baseline of emissions (which may or may not be given value under a legislative framework)



Legal Nature: VERs

■ Defined by contract

- Right to have a verified ER recognized in a national, regional or Kyoto trading scheme
- Can be defined to exist independent of a regulatory scheme – i.e. independent of the Kyoto Protocol.
- Less valuable than registered units as they contain registration/issuance risk
- CFB designed to move the market

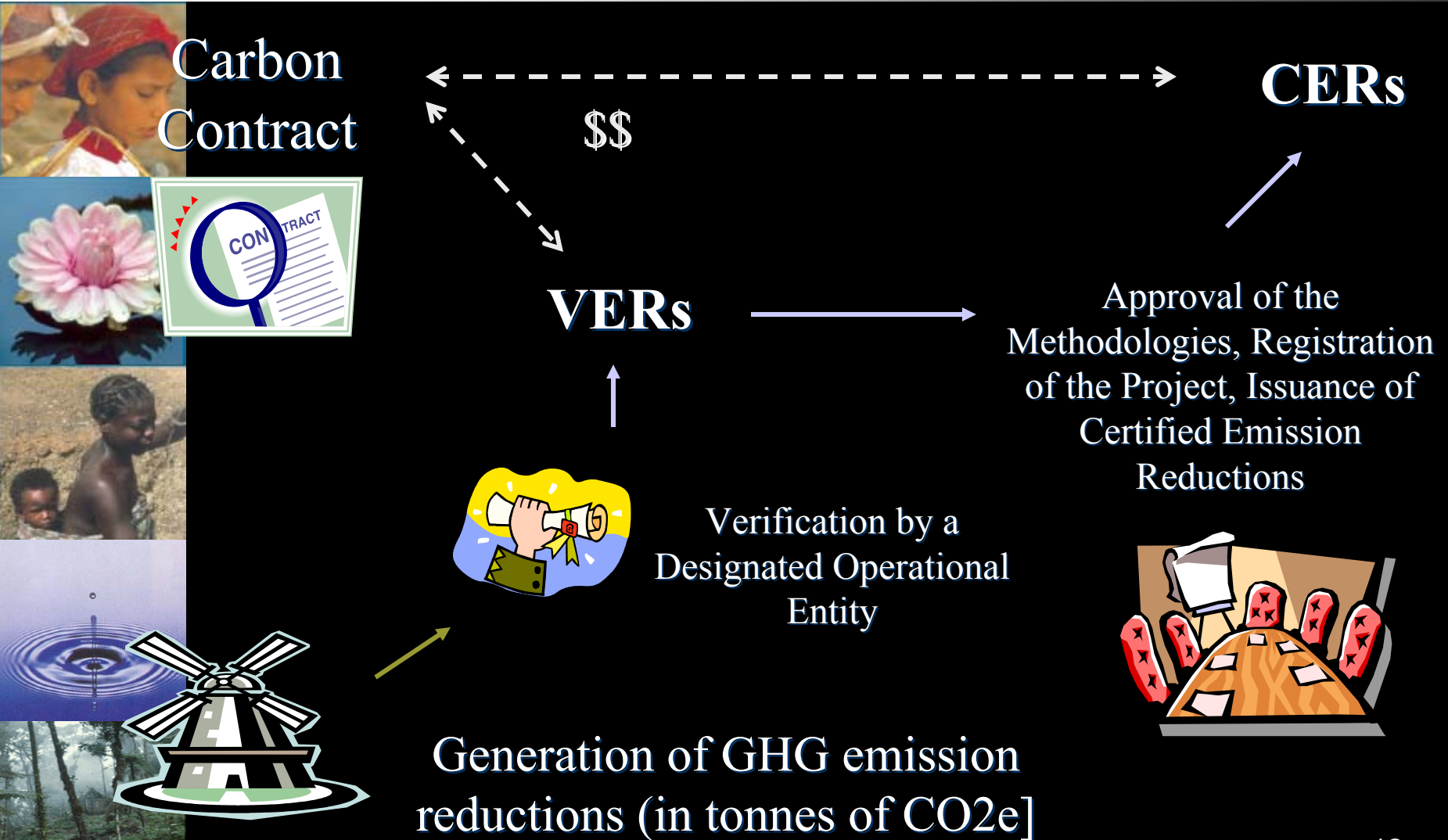


Key Contractual Provisions



- Definitions
- Purchase and Sale – Option
- Transfer of legal title
- Payment – (Cost Recovery)
- Monitoring, Verification and Certification
- Project Operation
- CER – obligation to sell CER
- Production Failure
- Defaults & Remedies
- Misc.

Generation of CERs from VERs



Kyoto Protocol: Current Constraints



■ CDM, JI:

- Complex & uncertain eligibility rules
- Lead time
- Underlying financing
- Industrial gases lack sustainable development impact
- Small, poorer countries are bypassed
- Post – 2012?

■ IET:

- Sellers must meet prerequisites
- Buyers want AAUs to be backed by real emission reductions

CFB Strategy: Solutions



■ CDM, JI:

- Benchmark new methodologies
- Help Host Countries develop project pipelines
- Catalyze underlying financing
- Demonstrate “greening” of industrial gases
- Seek clarity & govt commitments beyond 2012
- Defray KP registration risk

■ IET:

- Green Investment Schemes to fund RE/EE investment
- TA to help sellers meet prerequisites

CFB Strategy: Representing Sellers



■ ECA: Green Investment Schemes

- Designed for Bulgaria, Romania
- Planned for Czech, Slovak, Latvia
- Dialogue beginning with Russia and Ukraine

■ China: Greening Industrial Gases

- Channel proceeds of ER sales from HFC23 to renewables and other sustainable investment

■ Argentina: carbon/investment fund

- Govt request for Bank assistance to help develop and deliver carbon assets to global market

Carbon Finance: Impact by Technology



Energy Sector	Fossil fuel displacement	Methane mitigation
Renewables	✓	
Energy efficiency	✓	
Biomass cogeneration	✓	✓
Gas flaring reduction	✓	
Gas venting reduction	✓	✓
Coalmine methane	✓	✓

Fossil Fuel Displacement



Fuel Displaced	Generic Emissions Factor (tCO ₂ e/MWh)	Carbon Revenue at US\$4/tCO ₂ e (US\$/MWh)
Gas	0.40	\$1.60
Coal	0.85-1.0	\$3.40-\$4.00
Diesel	0.75-1.50	\$3.00-\$6.00

ER cash flows improve IRRs 0.5 – 2.0 % pts

Methane Mitigation



	Carbon Revenue* (methane only)	
	US\$/tcm CH4	US\$/MWh
Biomass cogen, landfill methane	\$60	~ \$18
Venting reduction, coalmine methane	\$52	~ \$16

Impact on IRR can be >30 percentage points

* at US\$4/tCO₂e

Impact of Carbon Finance



■ Revenue boost

- \$2 to \$5 per MWh for renewables, EE
- Up to \$20 per MWh /\$60/tcm for CH₄ mitigation

■ High quality cash flow

- OECD - sourced
- Investment-grade payor
- \$- or €- denominated
- Eliminate FX risk
- Financial engineering helps tap capital



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