

# Carbon Market, Carbon Finance and the “Methane Kick”

Methane to Markets  
Ministerial Meeting

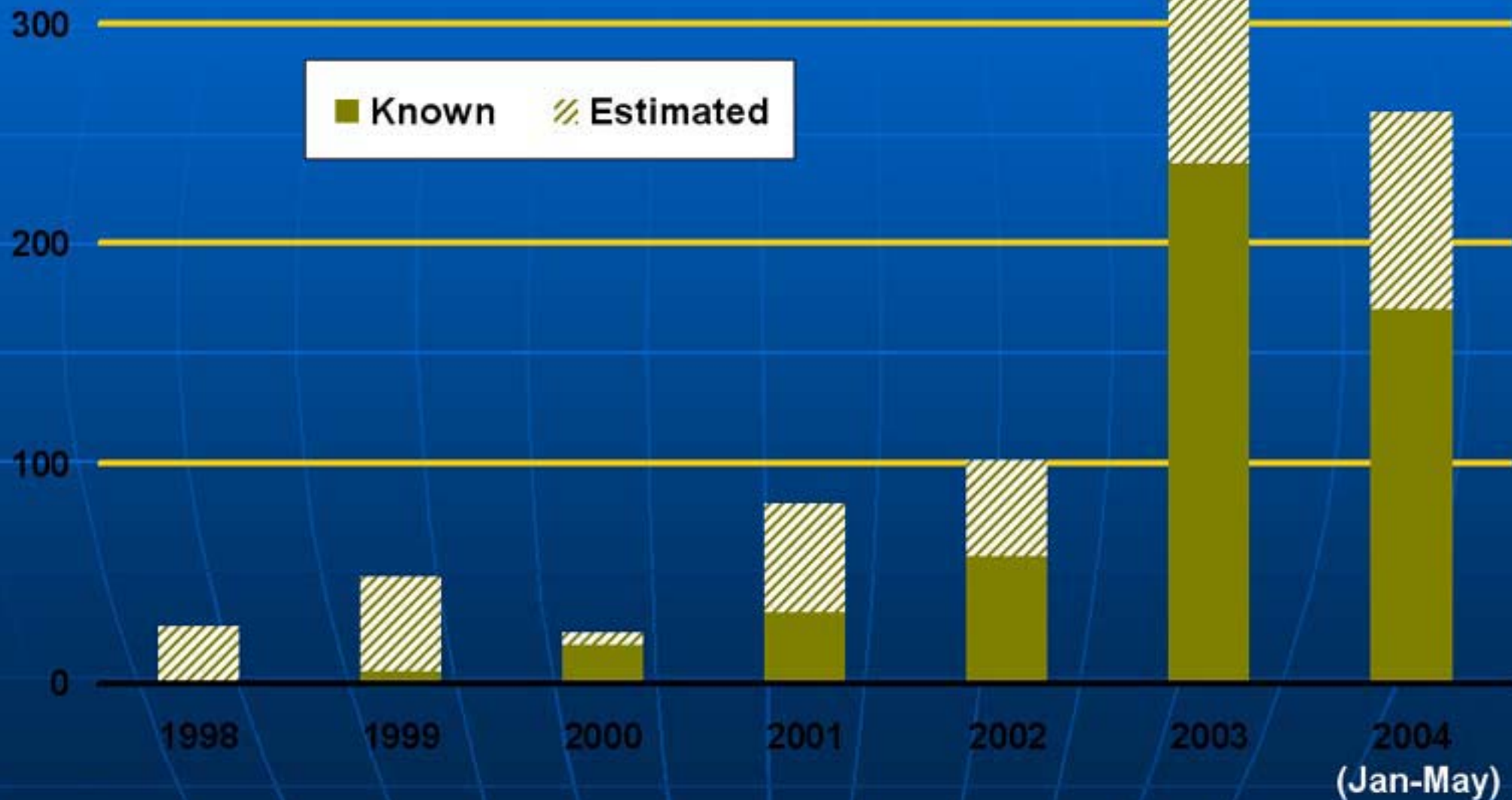
US EPA

November 15-17, 2004

Ken Newcombe, Carbon Finance Business, The  
World Bank

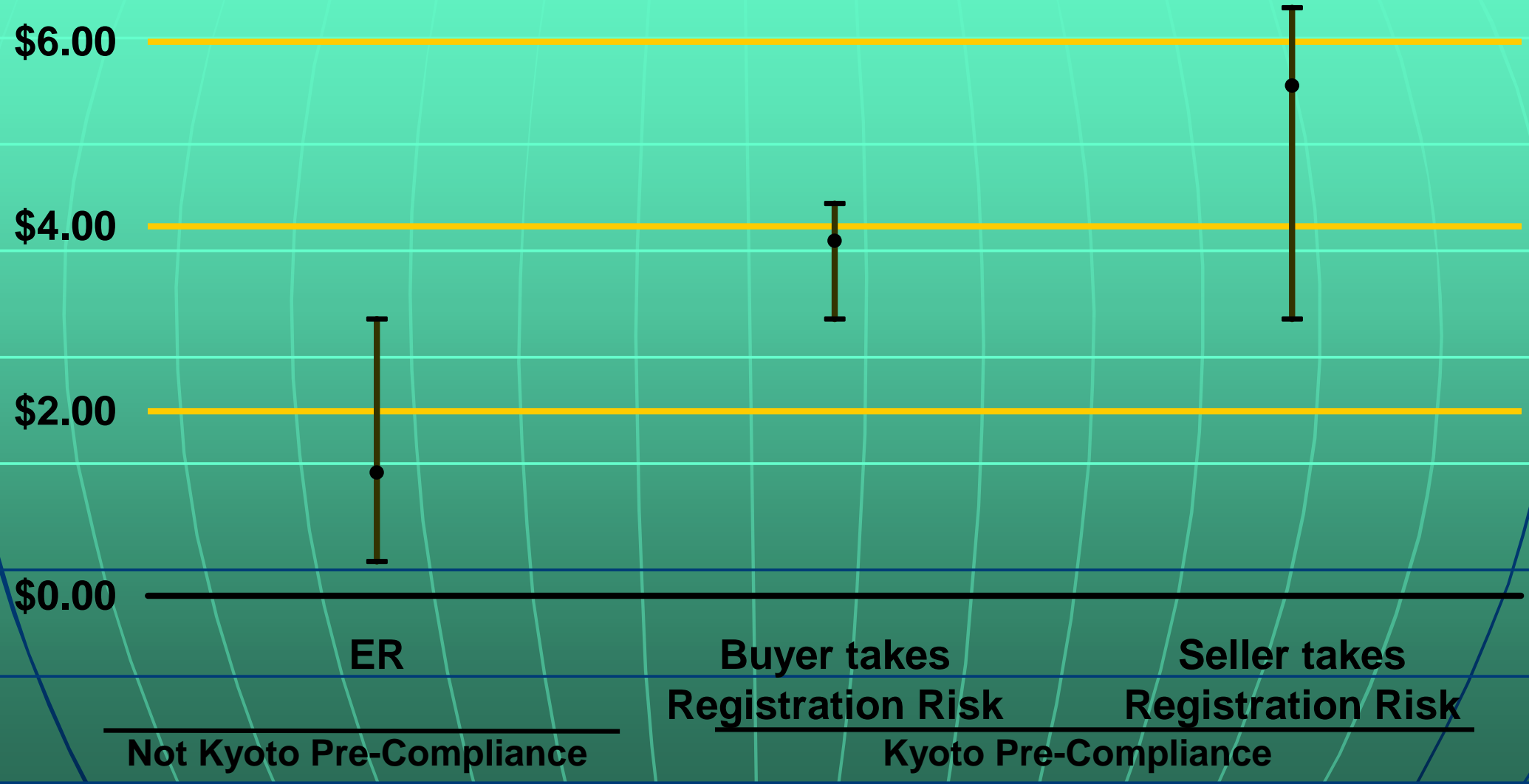
# Total Value of Carbon Projects

(in million U.S.\$, nominal)



# Prices since January 2003

(in U.S.\$ per metric tonne of CO<sub>2</sub>e)

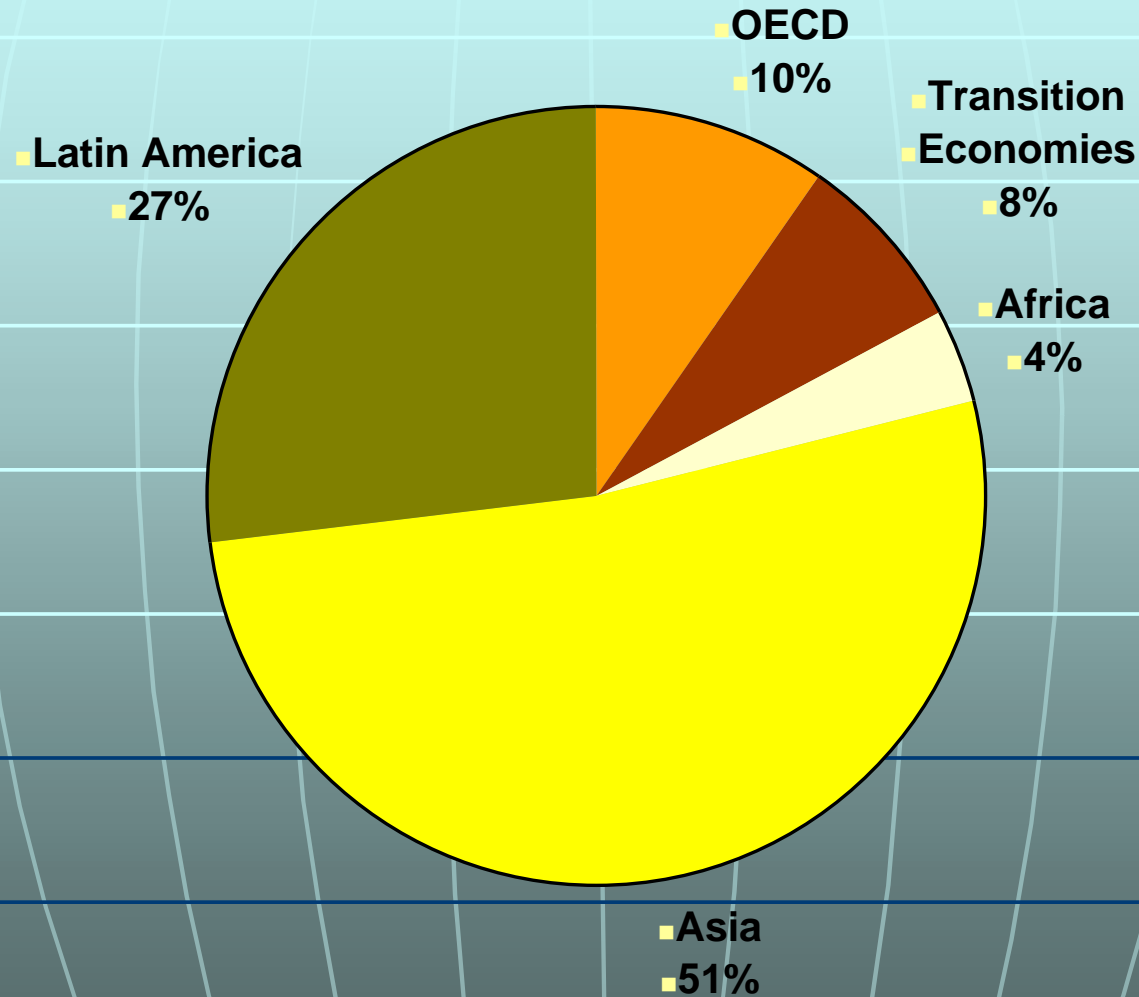


# Key Features of Carbon Finance

- Both public and private capital – new and additional sources for sustainable development financing
- Typically Payment on Delivery – carbon purchase contract from World Bank is “bankable”
- Payment stream is in hard currency, reducing financing risk for foreign lenders

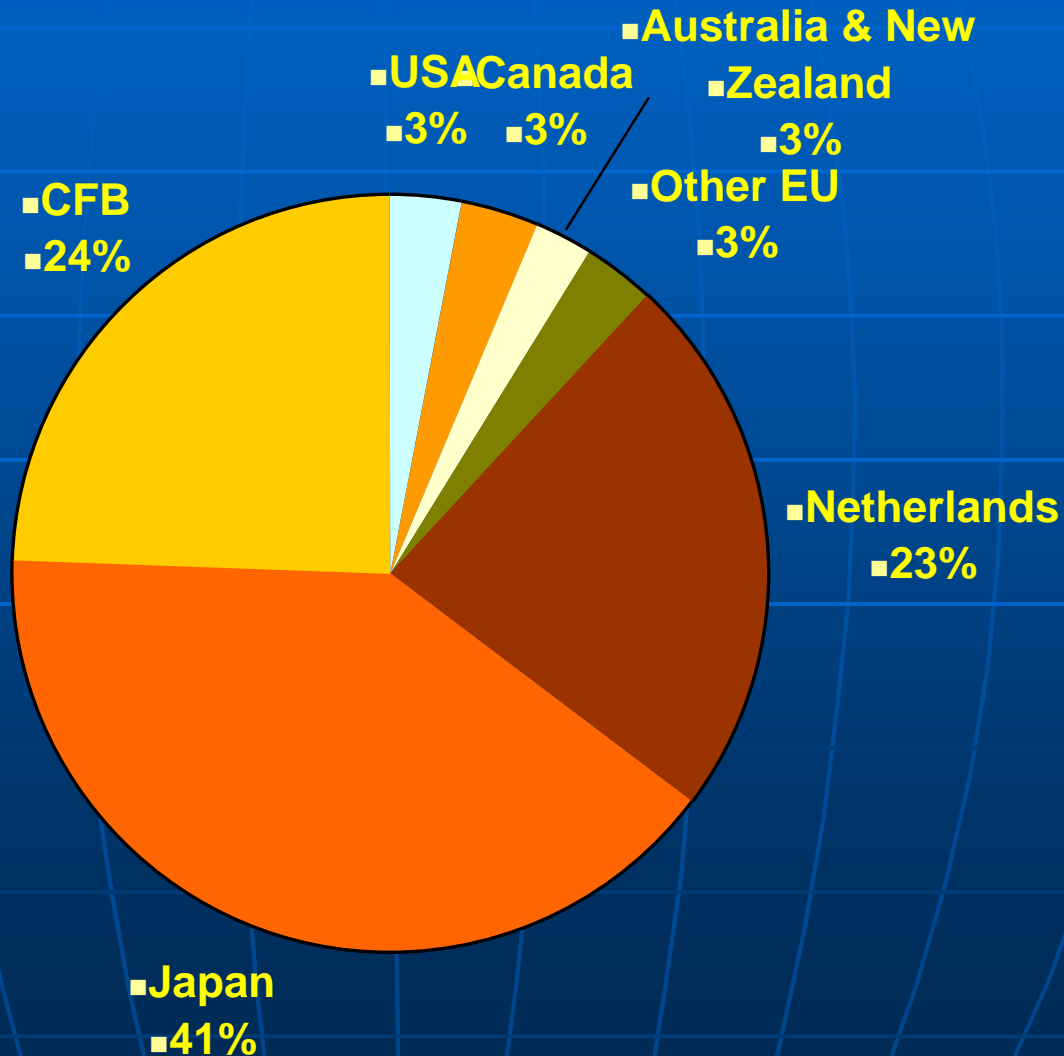
# Main Seller: Asia

In percent of volume sold from end 2003 to May 2004



# Main Buyers: Japanese Firms

In percent of volume purchased since Jan.2003

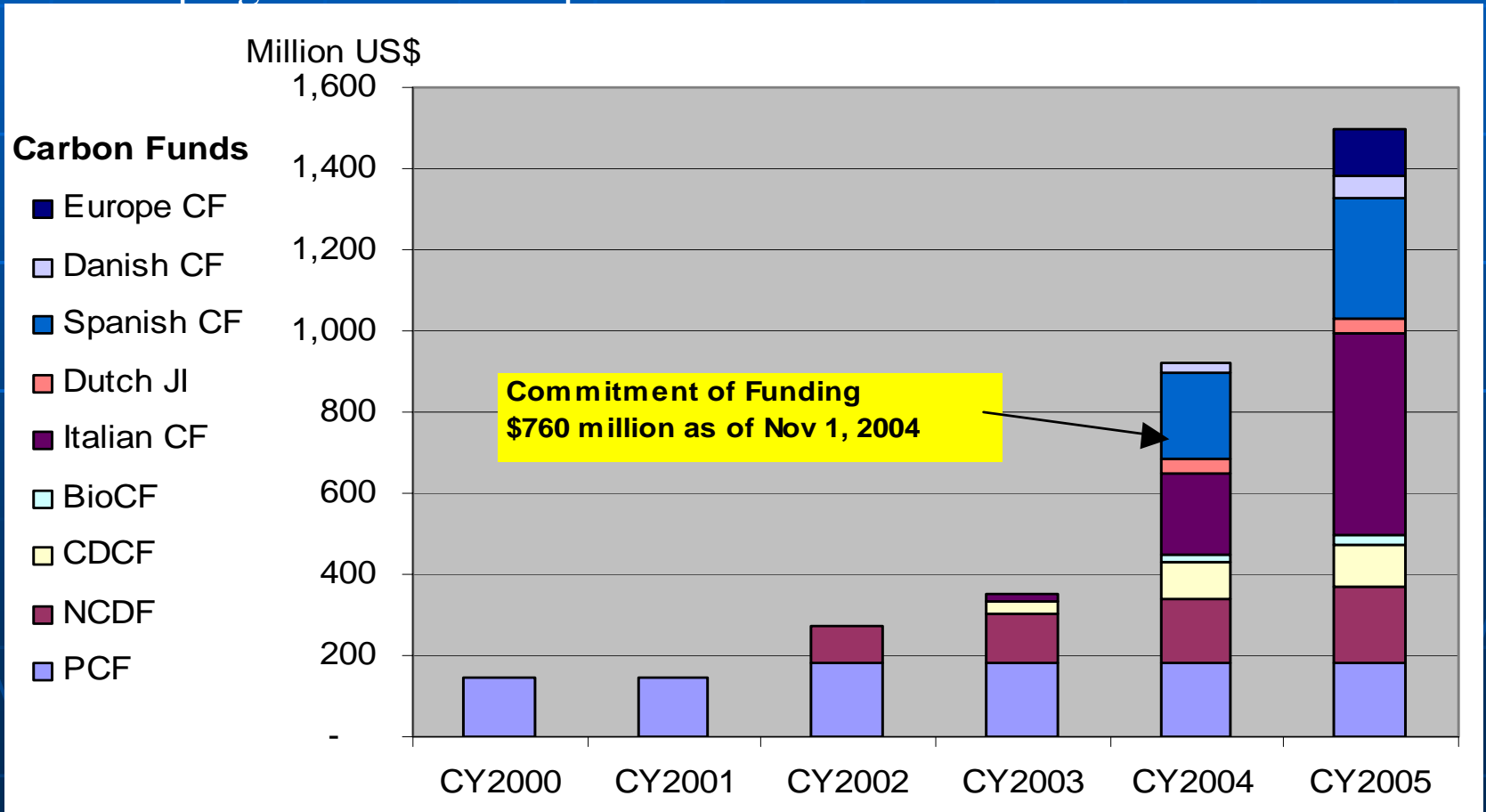


CFB = World Bank  
Carbon Finance  
Business.  
CFB also buys 40%  
of Netherlands needs

# Evolution of World Bank Carbon Funds

## Strategic Objectives

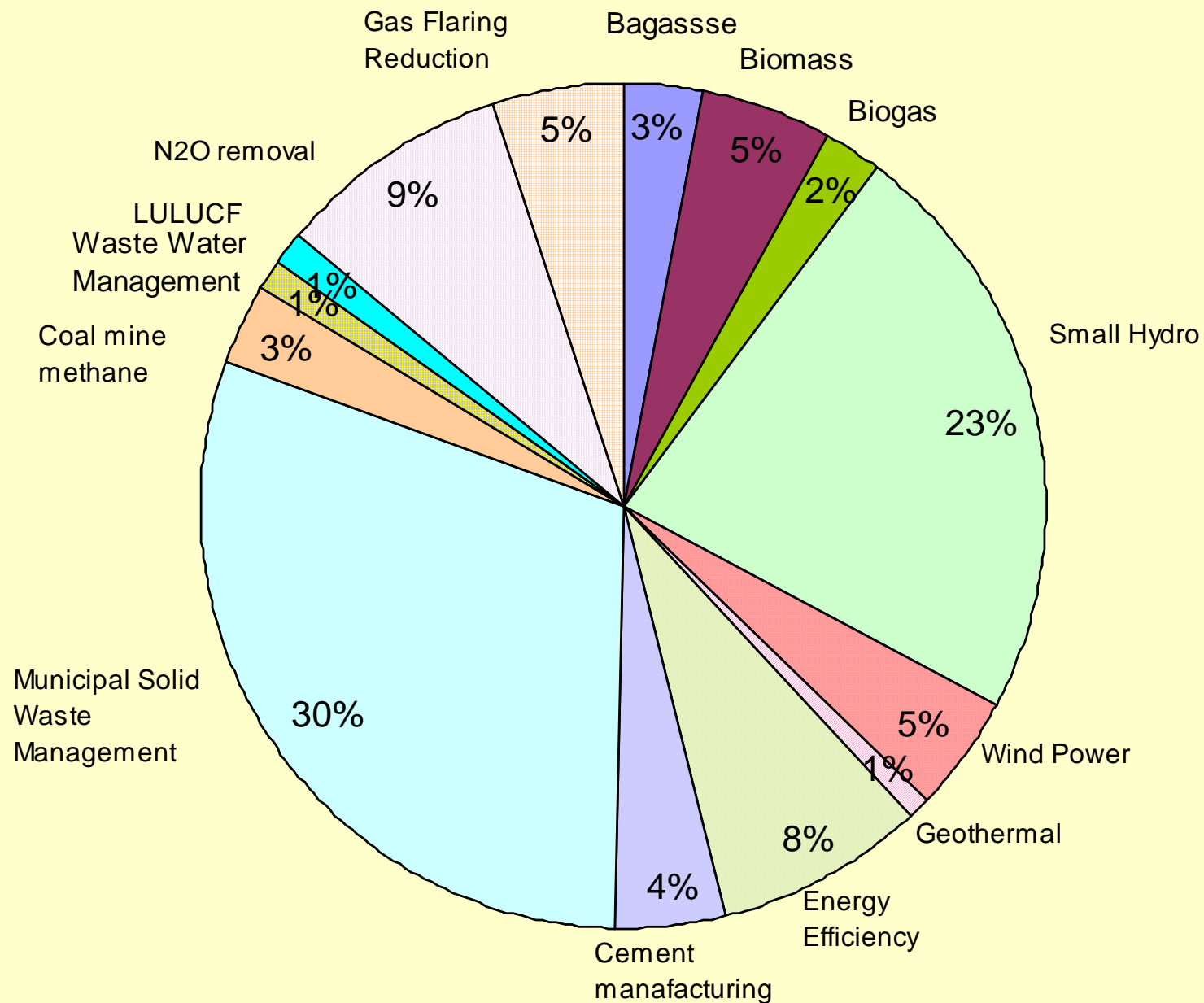
- I. Learning-by-Doing
- II. Addressing Market Distortion – Failure to serve small/poor and forestry/agricultural through carbon sequestration
- III. Developing CDM and Compliance Market



80% of funds are from governments (non-ODA)

# TECHNOLOGICAL DISTRIBUTION OF ACTIVE PIPELINE PROJECTS

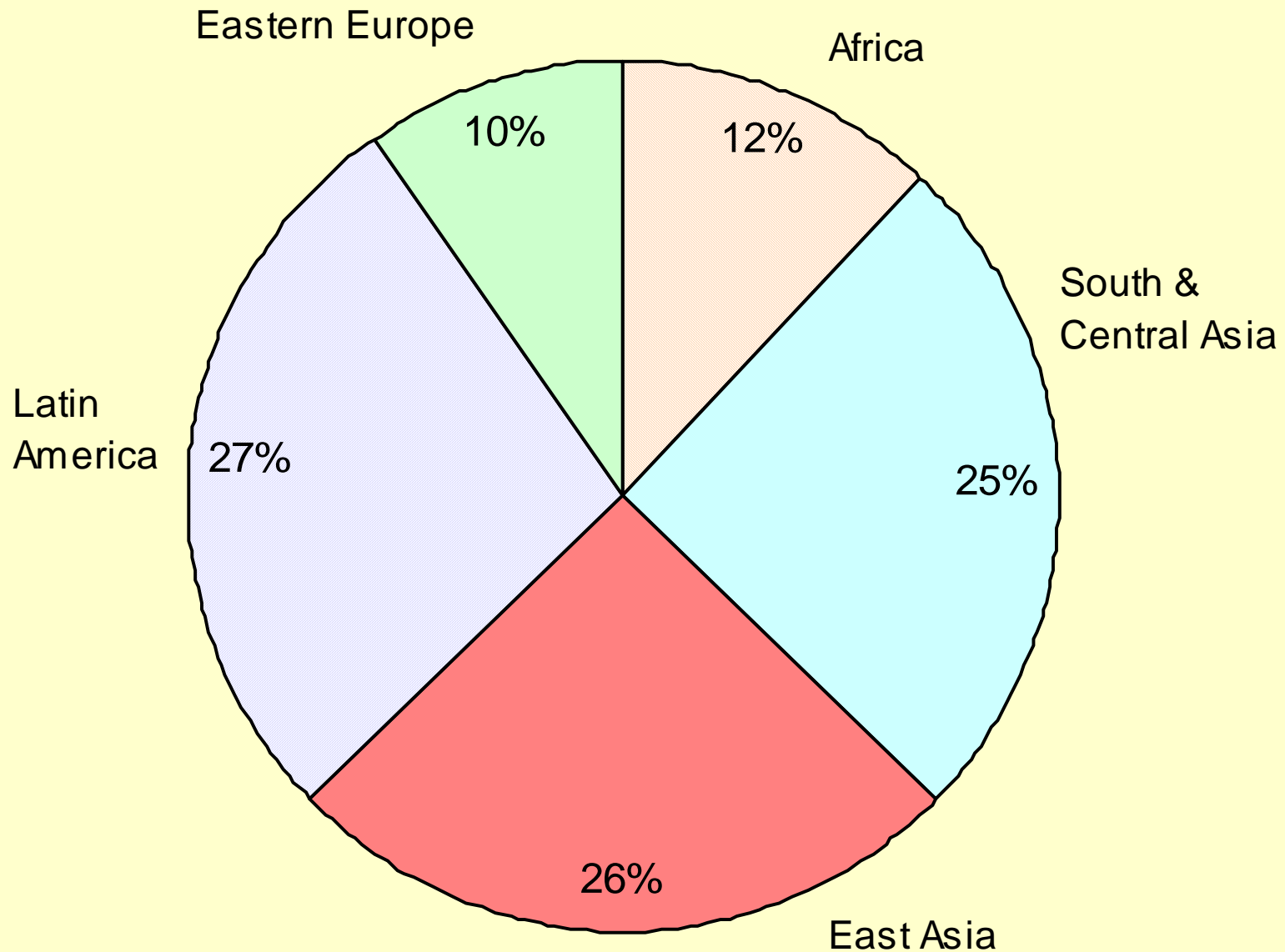
(Total Approx. US\$544 million with indicative purchase of 134 Million tons of CO<sub>2</sub>e for 106 projects as of Nov 2004)



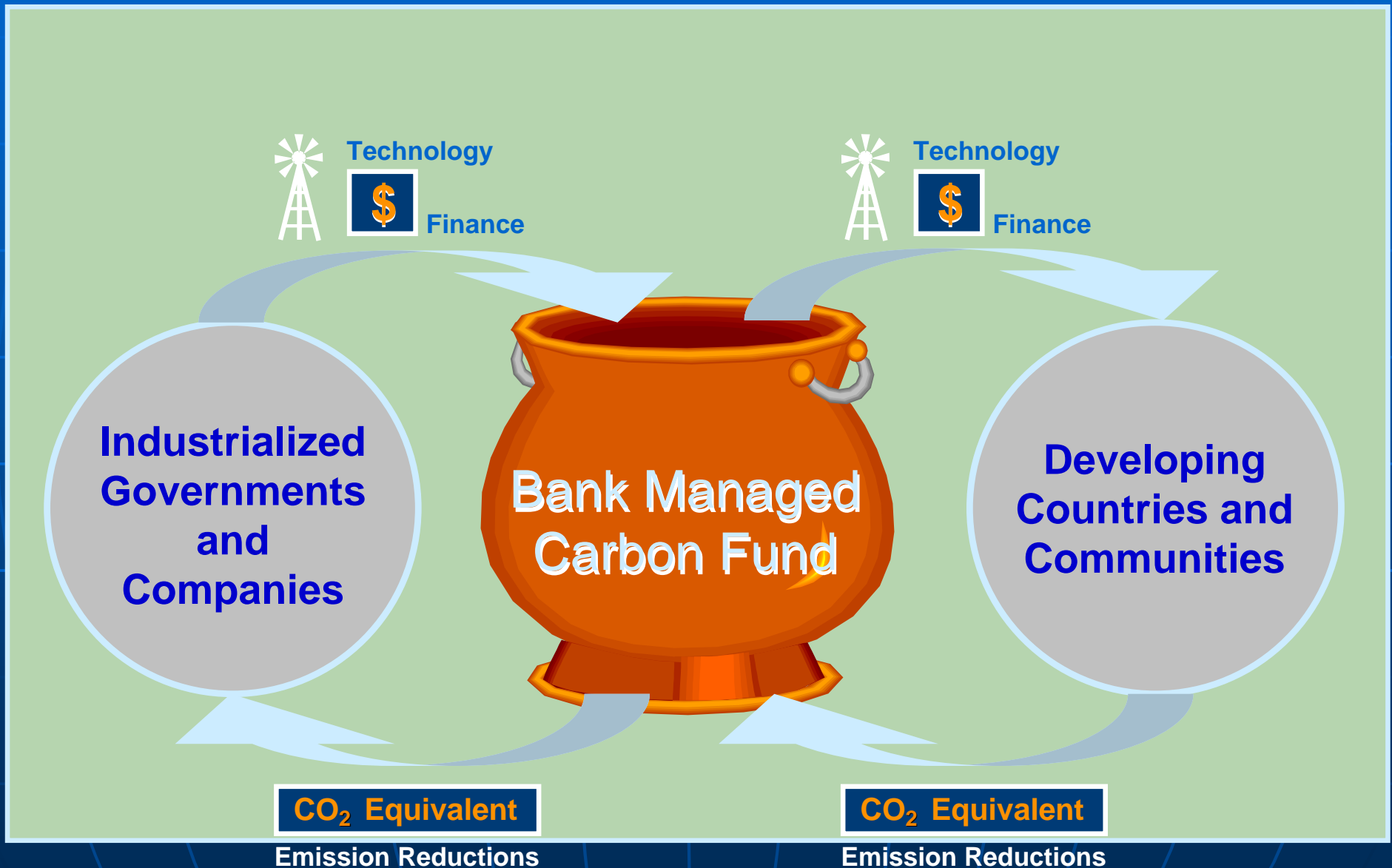


## GEOGRAPHICAL DISTRIBUTION OF ACTIVE PIPELINE PROJECTS

(Total approx. US\$544 million with indicated purchase of 134 Million tons of CO<sub>2</sub>e for 106 projects as Nov 2004)



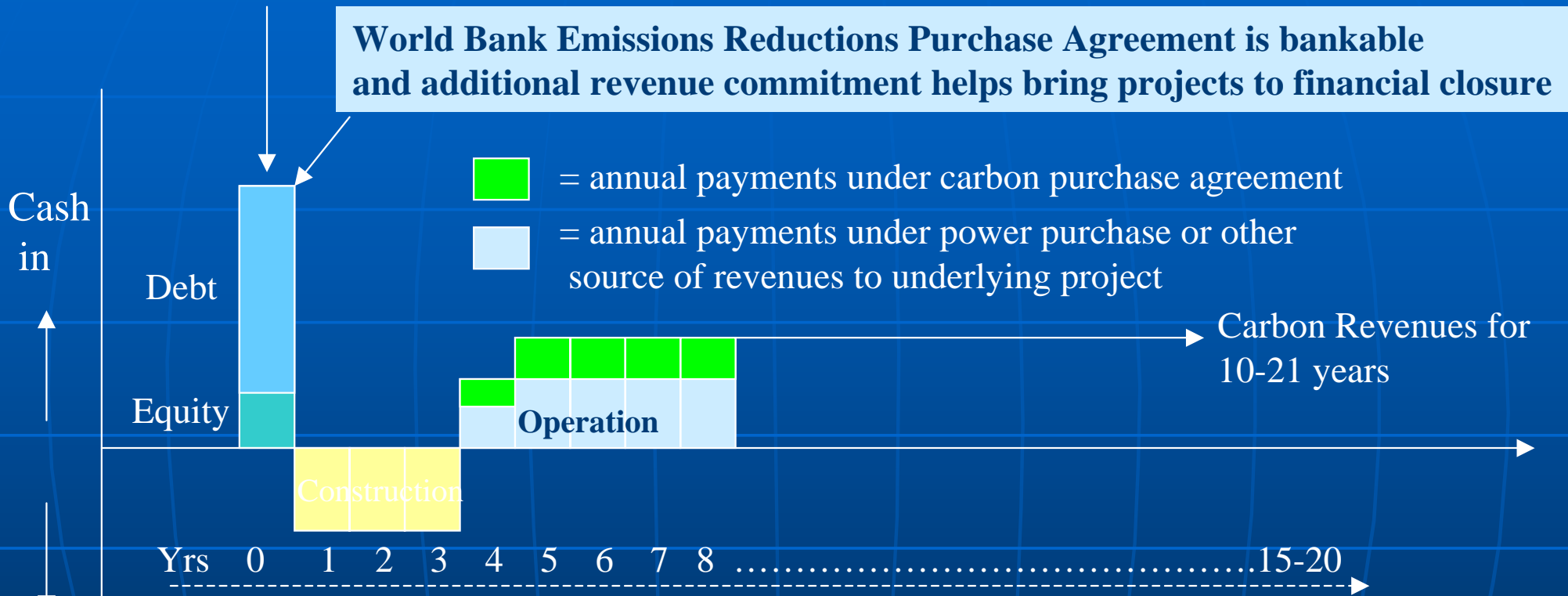
# How Carbon Funds Work



Payment on delivery of emissions reductions

# Understanding the impact of carbon finance on project financing and financial sustainability

Construction Capital for underlying climate friendly project



Carbon sales revenues are commonly in the range from 10-50% of total revenues for power and waste management projects

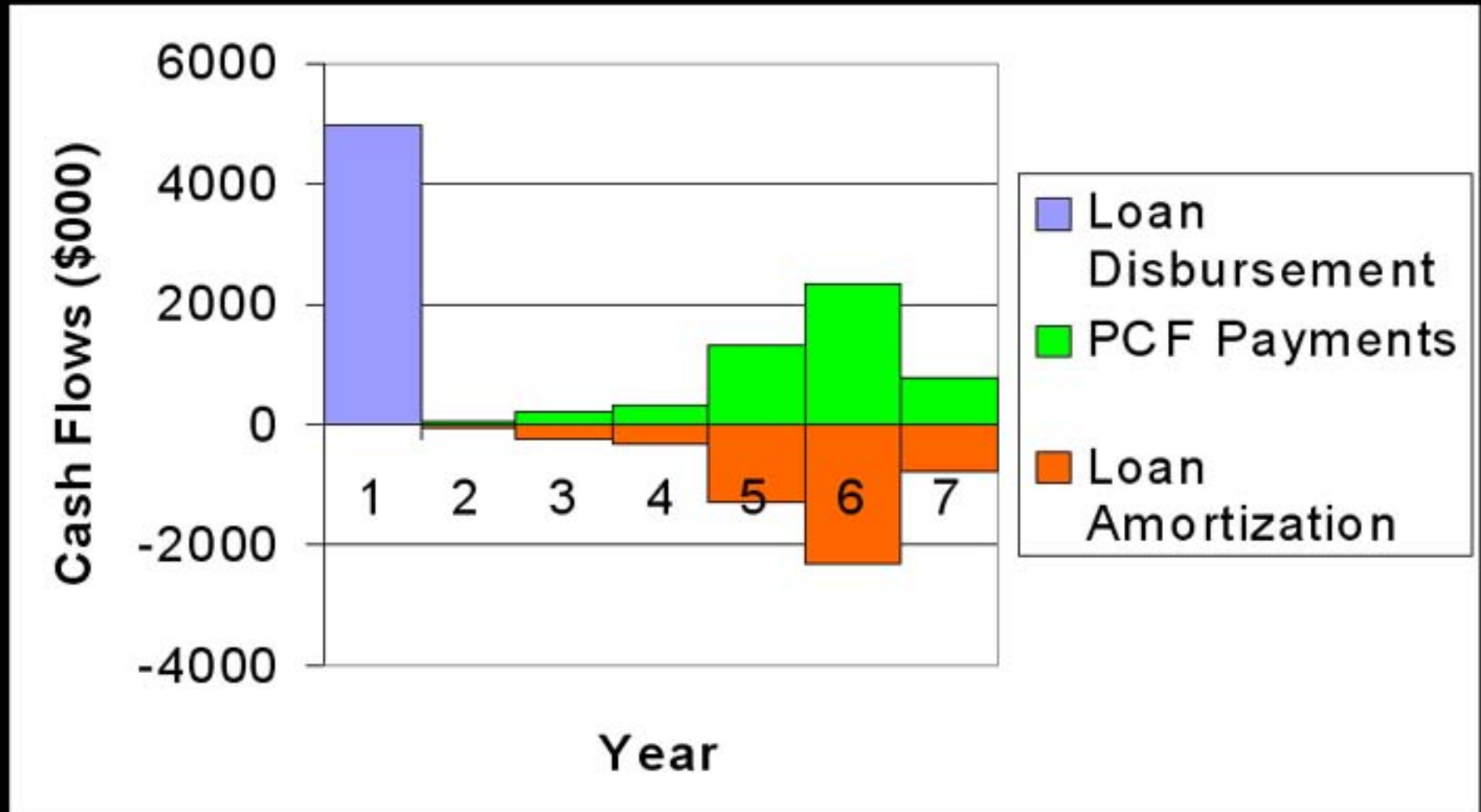
# Carbon Economics

**Increases in Project Rates of Return as a result of additional revenues from sales of Emissions Reductions (“Carbon”) at \$4/tCO<sub>2</sub>e**

<b>Technology</b>	<b>ΔIRR financial</b>
<b>Hydro, Wind, Geothermal</b>	<b>0.5-2.5%</b>
<b>Crop/Forest Residues</b>	<b>3-7%</b>
<b>Municipal Solid Waste</b>	<b>5-15+%</b>



# Brazil Forestry Project



*ER payments are used to amortize commercial loan.*

# ■ DISTRIBUTION OF UNDERLYING PROJECT FINANCE

■ (Total Underlying Financing of US\$3,198 million for \$454 million

■ in carbon purchases as of Sep 2004)

■ To be identified

■ 2%

■ Sponsor 13%

■ Commercial

■ Lender 26%

■ Host Country

■ Government

■ 2%

■ Other MDB &

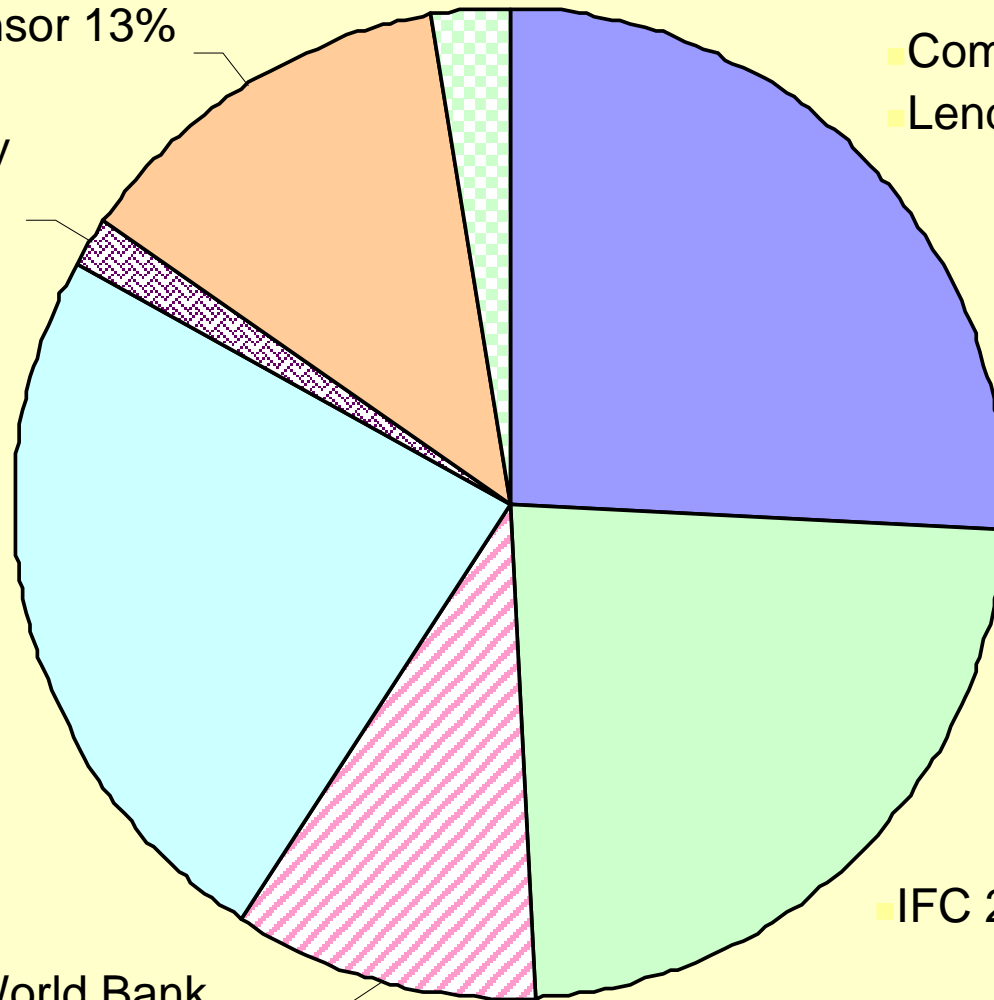
■ Bilateral Fund

■ 24%

■ World Bank

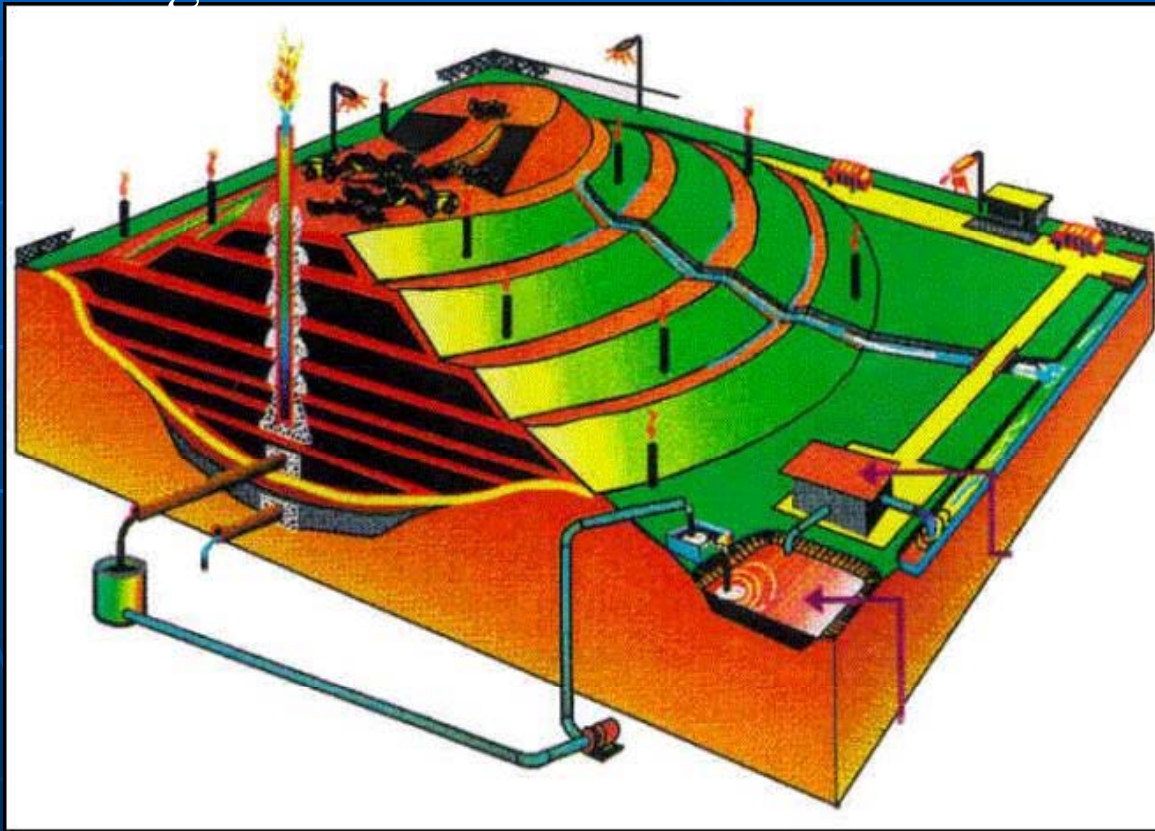
■ 10%

■ IFC 23%



# Typical elements of LFG project

1. Landfill gas recovery and flaring



2. Generation of electricity for

- Consumption on site
- Sale to the grid



3. Collection and treatment of leachate

# Spectrum of MSW Projects in Bank CF Portfolios





# Impact of Carbon Finance at \$4/tCO<sub>2</sub>e

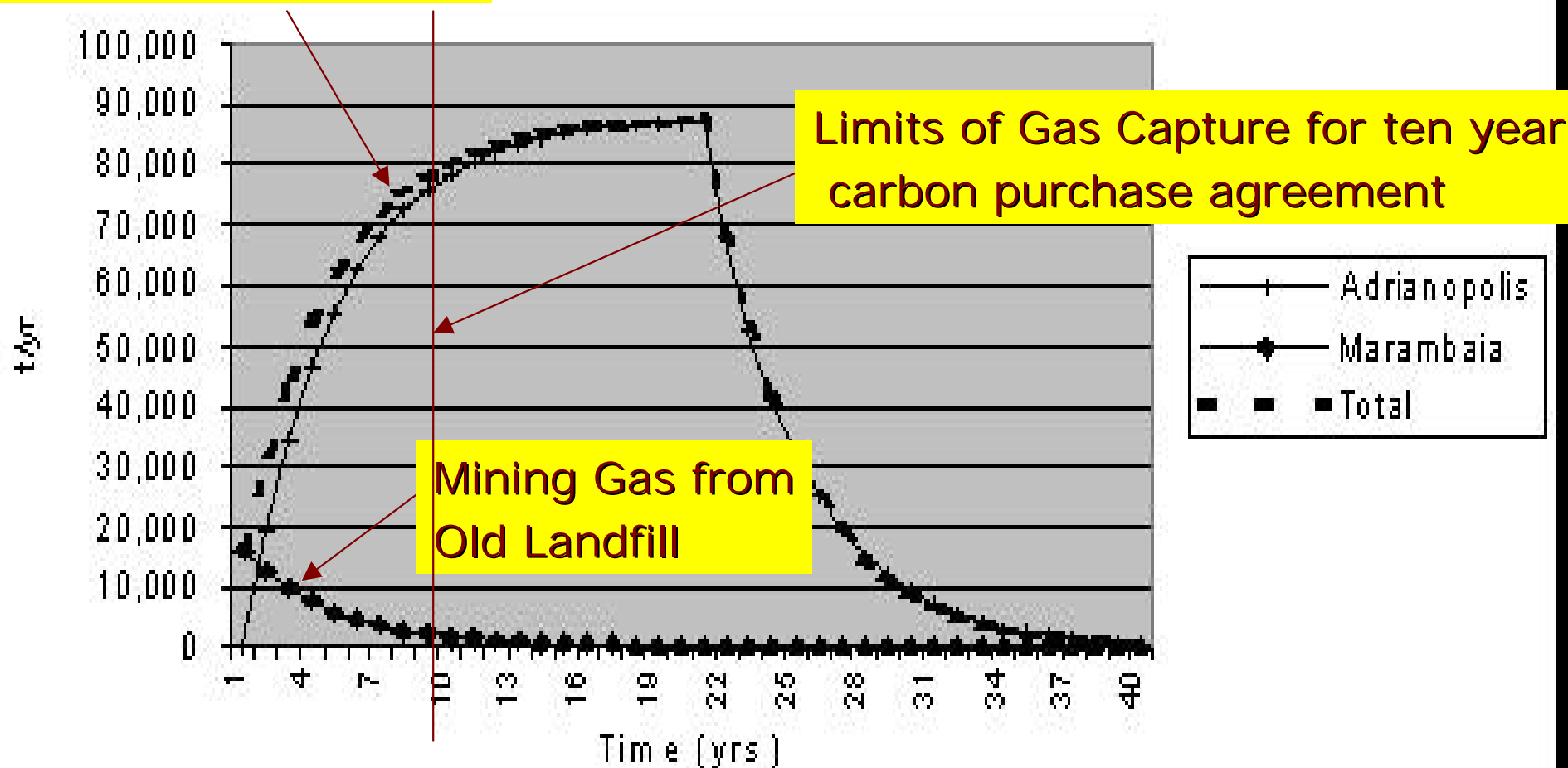
	FIRR w/o carbon*	FIRR with carbon	ΔIRR (%)
LFGTE of which:	15%	29%	14%
CO <sub>2</sub>	15%	17%	2%
CH <sub>4</sub>	15%	27%	12%
LFG flaring only	n.a.	26%	26%

*\*Assuming tariffs permit a 15% WACC for power gen.*

# Brazil Nova Gerar LFG Production (two sites)

Tapping Gas at new Sanitary Landfill

Methane production



# Leading Edge of Carbon Finance in Urban Waste Management

