

World Resources Institute

Carbon Value Analysis Tool

version 1.1



EPA Climate Leaders Partner Meeting
October 12, 2006
Arlington, VA

Context:

- Shift underway to market-based environmental policy
- Emissions trading at forefront of climate policy
- WRI working with corporate partners to develop useful applications



Many reasons for companies to consider “carbon value”



- Find the lowest-cost CO₂ emissions reductions
- Decide whether to make GHG reductions internally or buy them on the market
- Decide whether to implement or postpone projects with marginal returns
- Evaluate profit through carbon trading and market positions



Carbon Value Analysis Tool (CVAT), version 1.1

World Resources Institute, Climate Northeast Project



Introduction

Overview: The Carbon Value Analysis Tool (CVAT) is a screening tool to help companies integrate the value of carbon dioxide emissions reductions into energy-related investment decisions. It has two main purposes:

Test the sensitivity of a project's internal rate of return (IRR) to "carbon value" (the value of GHG emissions reductions). CVAT integrates this value into traditional financial analysis by ascribing a market price, either actual or projected, to carbon emissions reductions.

Facilitate the development of emissions reduction strategies by developing a Marginal Abatement Cost Curve (MACC) across a portfolio of projects. CVAT ranks projects so managers can prioritize them according to their implicit cost per tonne of carbon emission reduction.

Operating Requirements: Excel 2000 or later. Some functionality may be lost with earlier versions of Excel. Security level must be set to Medium and Macros must be enabled to operate CVAT. To enable macros, click on Tools > Macros > Security > Medium from the Toolbar Menu.

CVAT operates most efficiently when Auto-Save is turned off: [Auto Save Off](#)

To Begin: Click on "Analyze a Project" or "Project Portfolio" below:

Analyze a Project

- Conduct cash flow analysis
- Calculate marginal abatement cost
- Estimate emissions reductions
- Analyze the carbon value of the project
- Perform risk analysis
- Modify energy price and foreign exchange assumptions
- Save project data to the project portfolio

Project Portfolio

- View project portfolio database
- Sort database and compare projects
- View marginal abatement cost curve

Help: For assistance, click on any [Help Link](#) or help symbol: [?](#)

Version 1.1 release date: September 8, 2006

CVAT Overview

FAQ

Acknowledgement

Disclaimer

2 separate (but related) points to consider in relation to IRR calculations:

1. Shadow pricing → Integrate a carbon price into IRR calculations
2. Marginal Abatement Cost Curve (MACC) → Use the IRR hurdle rate to reveal the cost of carbon reductions



Price of carbon? ...it depends on the market

Commodity	Market	Currency	Recent Prices (\$/tonne)
Allowance	EU ETS	EUA	\$14-18
	Chicago Climate Exchange	CFI	\$2-4
	RGGI	tbd	projected \$2-6
	California ETS ?	?	?
	Australia ETS ?	?	?
	Canada ETS ?	?	?
Credit	Clean Dev. Mechanism (CDM)	CER	\$3-12
	Joint Implementation (JI)	ERU	\$3-12
	Voluntary	VER	\$1-3

CER Certified Emissions Reduction
 CFI Carbon Financial Instrument
 EUA European Union Allowance
 ERU Emissions Reduction Unit
 VER Verified Emissions Reduction



What are your internal costs to reduce CO2?

- Consider the gap between the your corporate hurdle rate and the IRR of a carbon emissions reduction project
 - For carbon projects with strong IRRs that exceed the hurdle rate, the carbon emissions reductions have zero or negative cost
 - For carbon projects with weak IRRs below the hurdle rate, the carbon emissions reductions have a cost – the delta between the rates



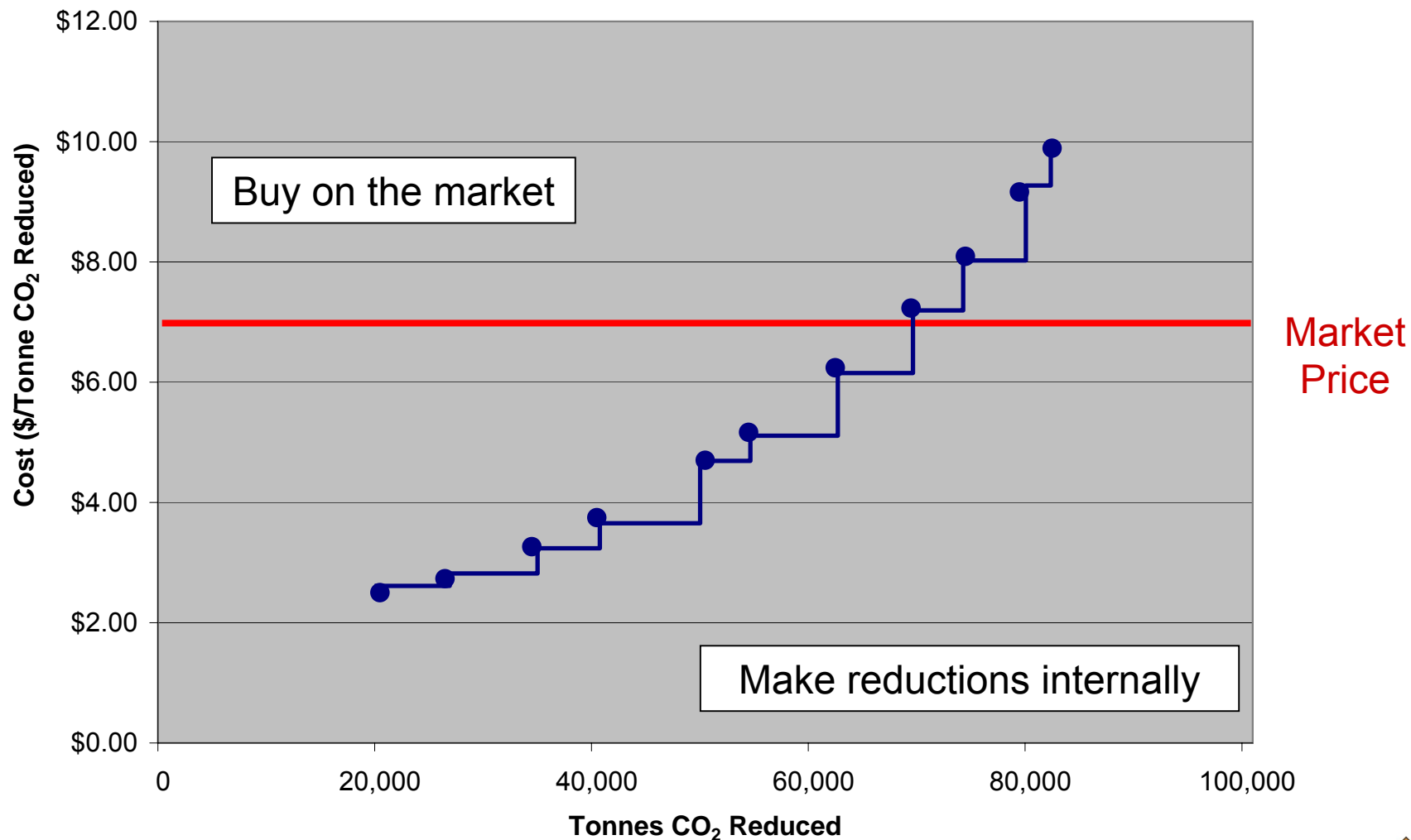
Rank projects by cost per tonne of CO₂

Hypothetical Project Portfolio

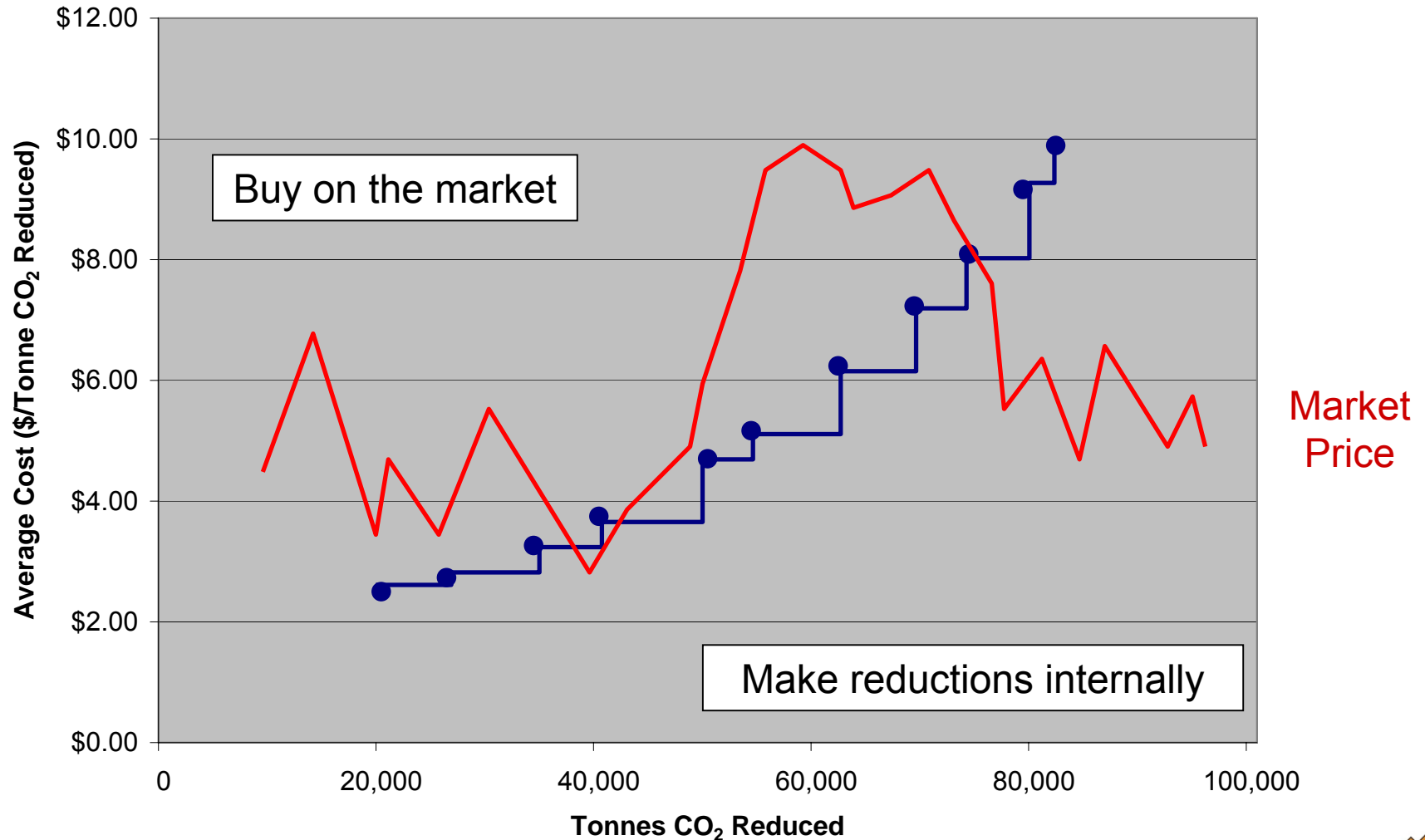
Project	Tonnes CO ₂ Reduced	Cost per Tonne	Total Cost of Reductions	Cumulative Abatement (tonnes)	Cumulative Cost (\$/tonne)
A	20,000	\$2.50	\$50,000	20,000	\$50,000
B	6,000	\$3.50	\$21,000	26,000	\$71,000
C	8,000	\$5.00	\$40,000	34,000	\$111,000
D	6,000	\$6.50	\$39,000	40,000	\$150,000
E	10,000	\$8.50	\$85,000	50,000	\$235,000
F	4,000	\$11.00	\$44,000	54,000	\$279,000
G	8,000	\$13.50	\$108,000	62,000	\$387,000
H	7,000	\$16.00	\$112,000	69,000	\$499,000
I	5,000	\$20.00	\$100,000	74,000	\$599,000
J	5,000	\$25.00	\$125,000	79,000	\$724,000
K	3,000	\$29.00	\$87,000	82,000	\$811,000



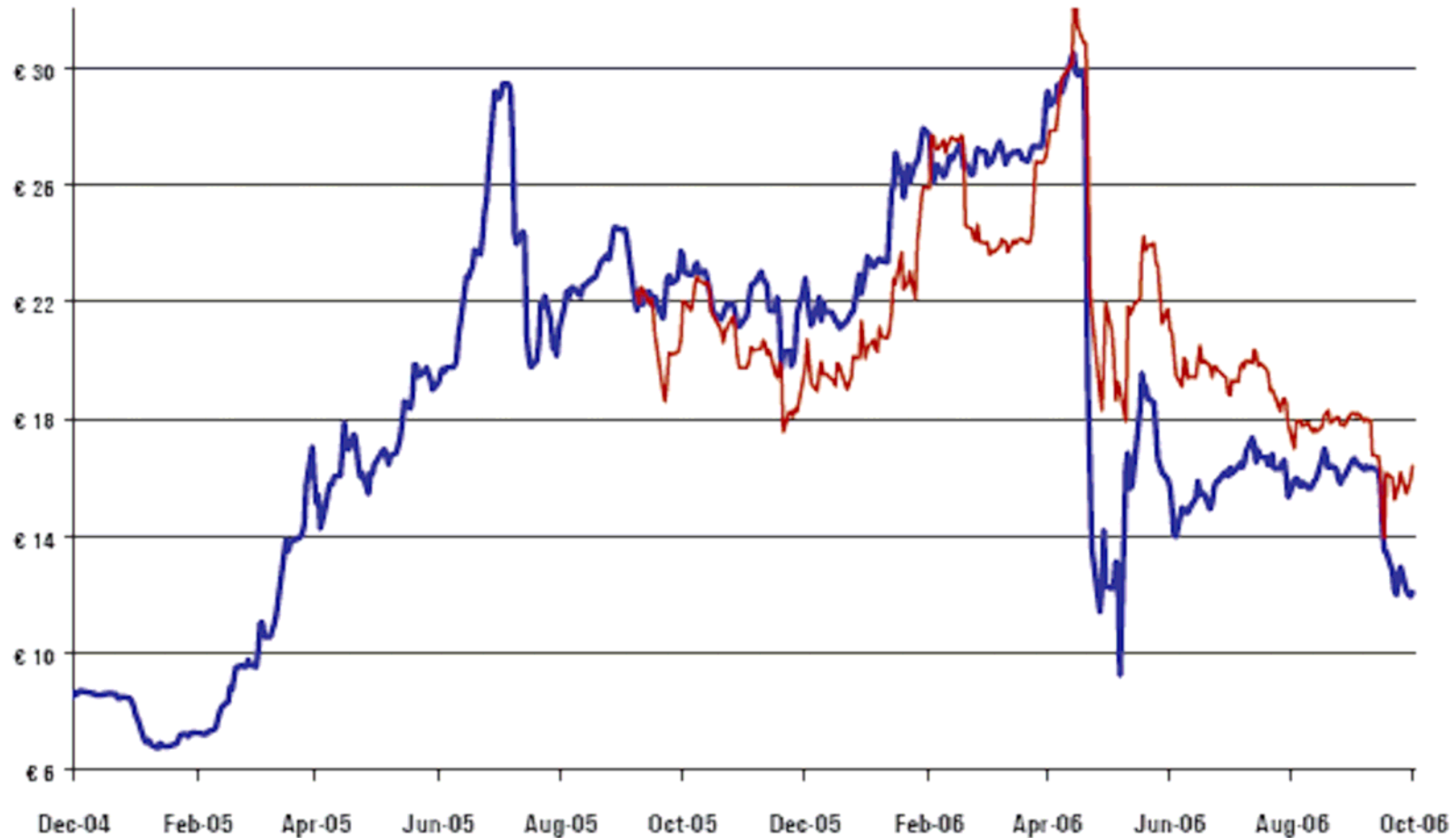
The “make or buy” decision



Need to consider market price fluctuations



Significant EUA price fluctuations



Source: Point Carbon. The graph shows daily bid-offer close EUA Dec 2006 prices from December 2004 (blue line) in the OTC market, and EUA Dec 2008 from Sept 2005 (red line). The data was updated 5 October 2006. The data is published daily at www.pointcarbon.com.



Thank You

Comments & Questions



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