

Carbon Credit Purchasing in the Local Decision Context

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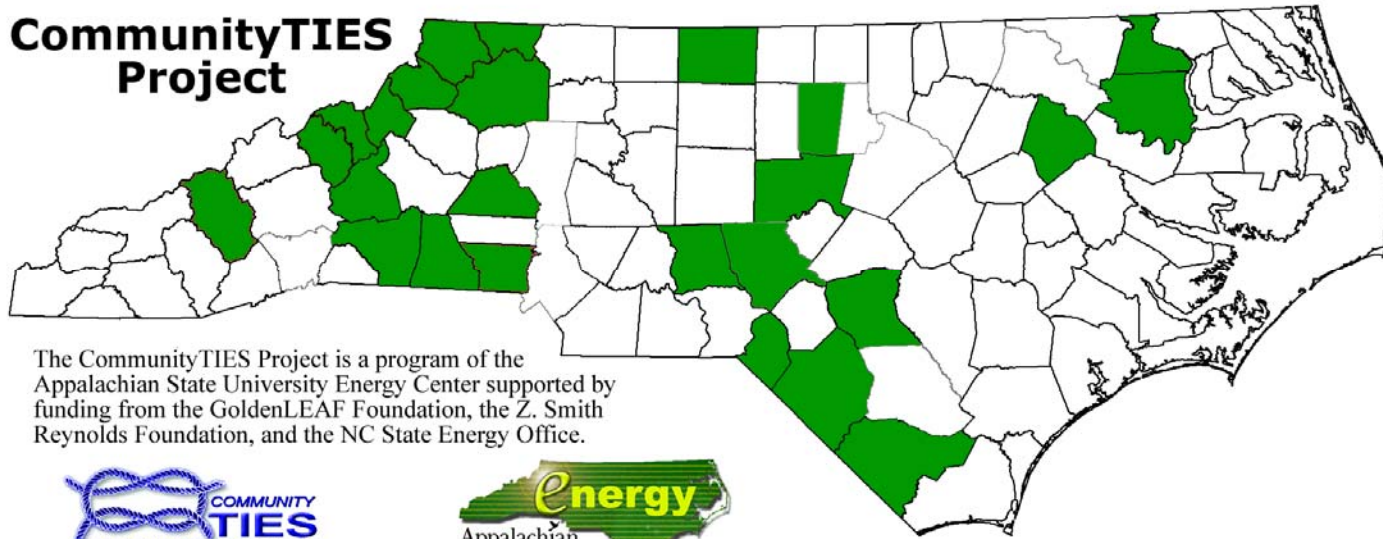
13th Annual LMOP Conference

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CommunityTIES Project

Leverage local LFG resources as a source of economic development and job creation

CommunityTIES Project



The CommunityTIES Project is a program of the Appalachian State University Energy Center supported by funding from the GoldenLEAF Foundation, the Z. Smith Reynolds Foundation, and the NC State Energy Office.



- Program based on EnergyXchange, Catawba Eco-Complex, Jackson County Eco-Park LFG projects



Our Role

- Target “marginal” value landfills
- Develop community capacity & leadership
- Support technical assist, networking, etc.

AND...

- Financial analysis of development contract proposals and deal structures

Carbon Credit Purchase Offer Terms

- **Pricing:** fixed payment, royalty, profit share
- **Timing:** investment, annual payments, forward contract, etc.
- **Administrative Responsibilities & Costs**
- **Rights to (price of) Energy Assets:** unused gas, waste heat from generators, etc.
- **Capital Assets:** at contract/renewal term end

Financial Analysis

LFG Projects Have Risk

- Performance, market, etc.

Contract Terms...

- Allocate risk
- Allocate reward

+_Risk = +_Reward

- Risk-reward tradeoff



Local Decision Context

How Much Additional Reward is Required to Justify Additional Risk?

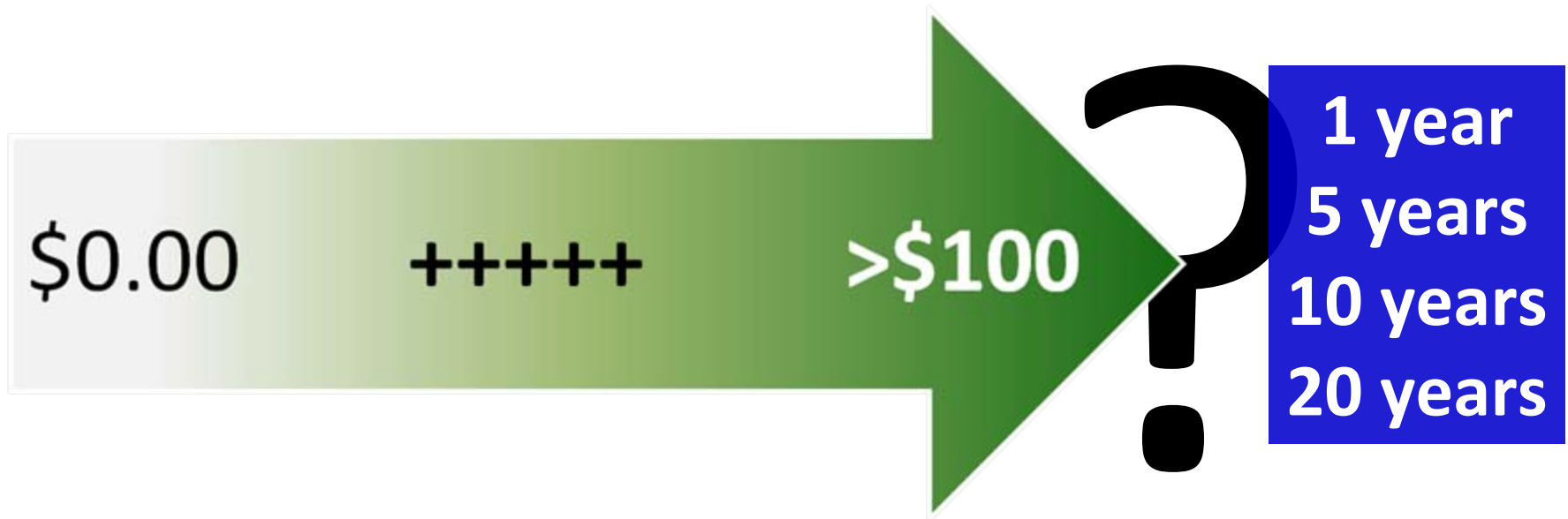
- **Priorities:** list, rank, and weight outcomes
 - ‘Result set’ of acceptable outcomes
- **Assets:** financial, human, and natural capital
 - ‘Limiting parameters’ of feasible options
- **Tradeoffs:** “exchange rate” between factors

LFG Project Risks

Compare risk-reward ratio of terms

- Future Gas Volumes
 - Waste quantity & type, design integrity, etc.
- Installation & Operating Costs
 - Materials, labor, equipment, system maintenance
- Future Market Prices (carbon, RECs, mMBtu)
 - Policies and regulations, LFG eligibility, derating

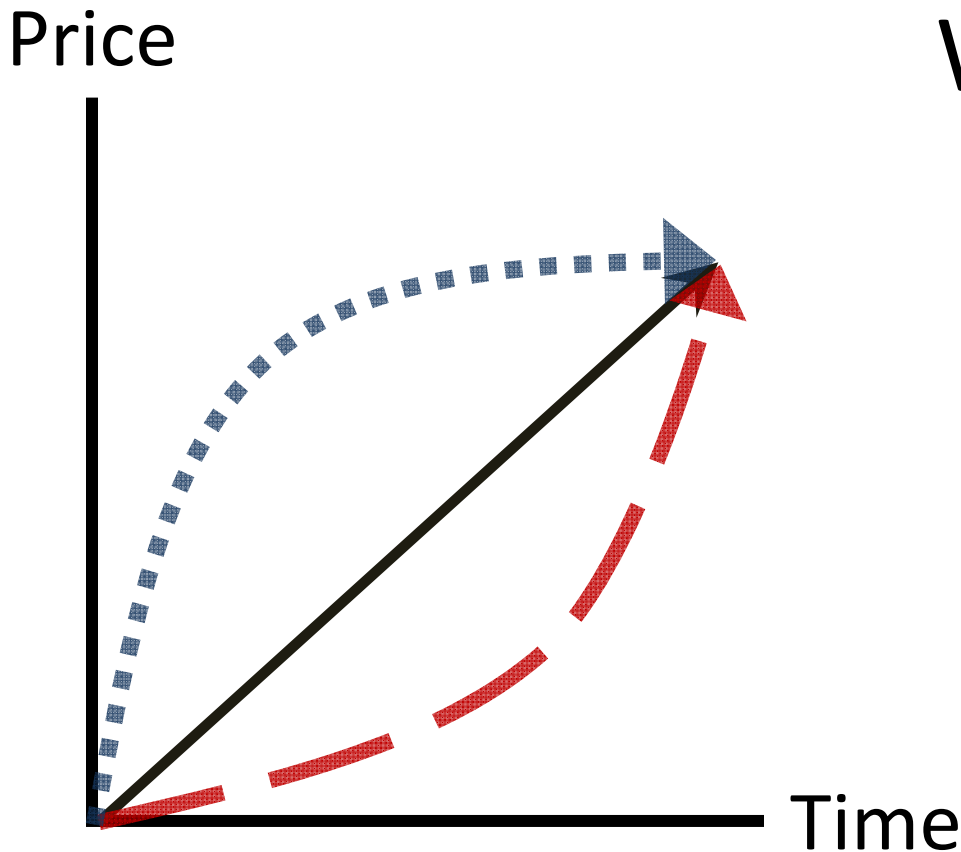
Who Knows What a Carbon Credit is Worth?



Uncertainty = Risk

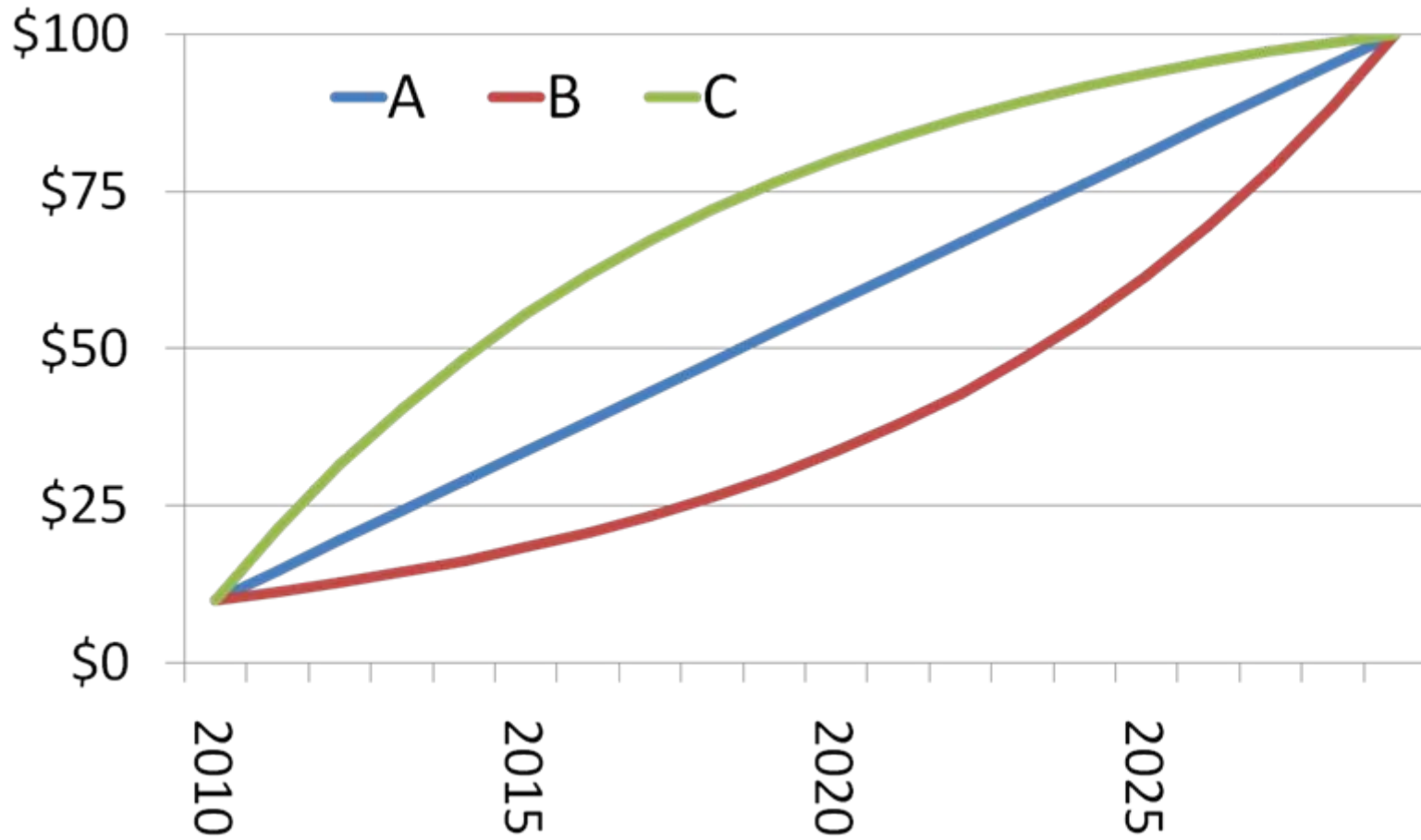
Everyone manages risk differently

Because LFG Flow Declines Over Time



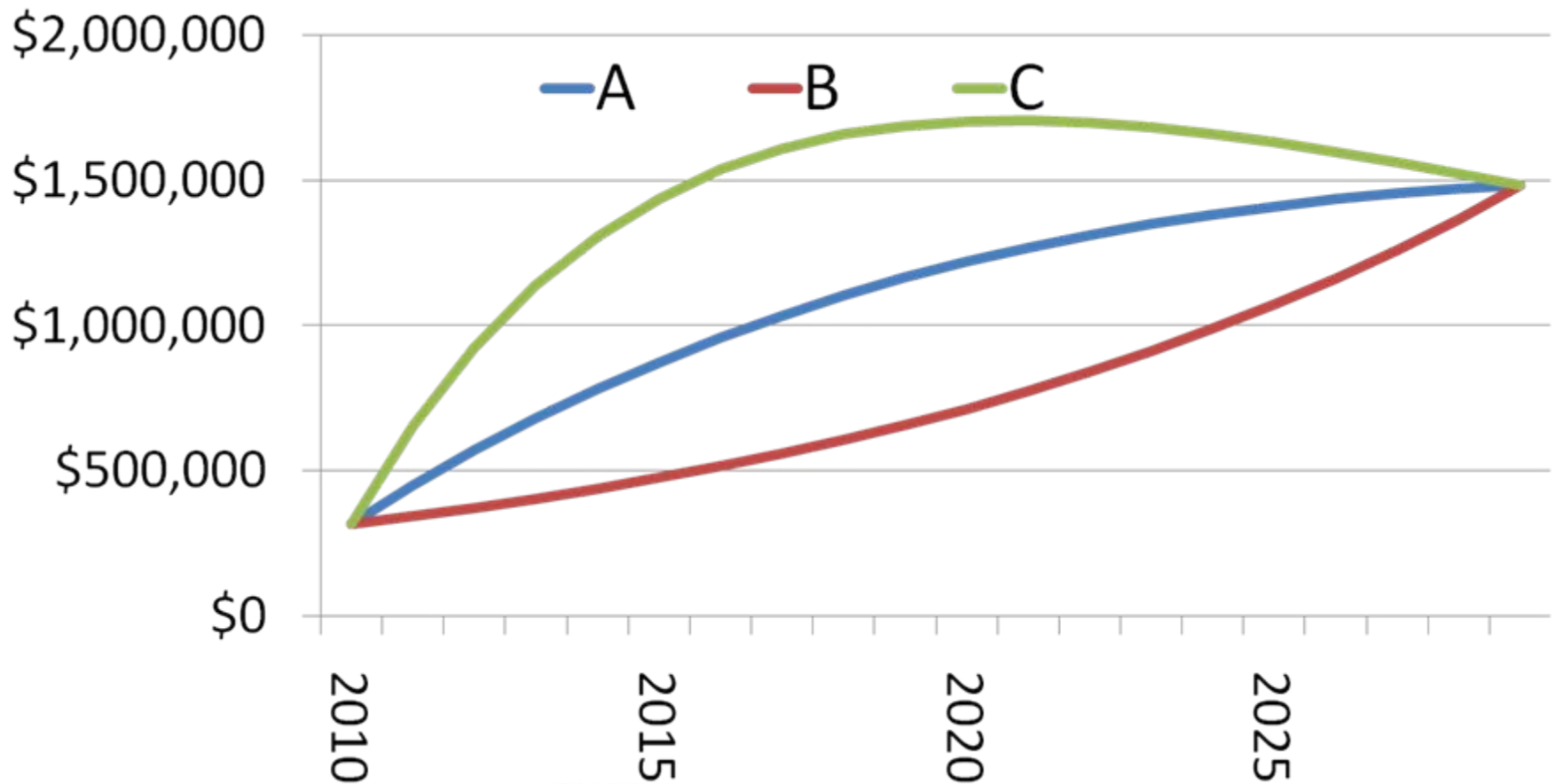
WHEN carbon prices change is just as important as HOW MUCH they change

Carbon Market Prices



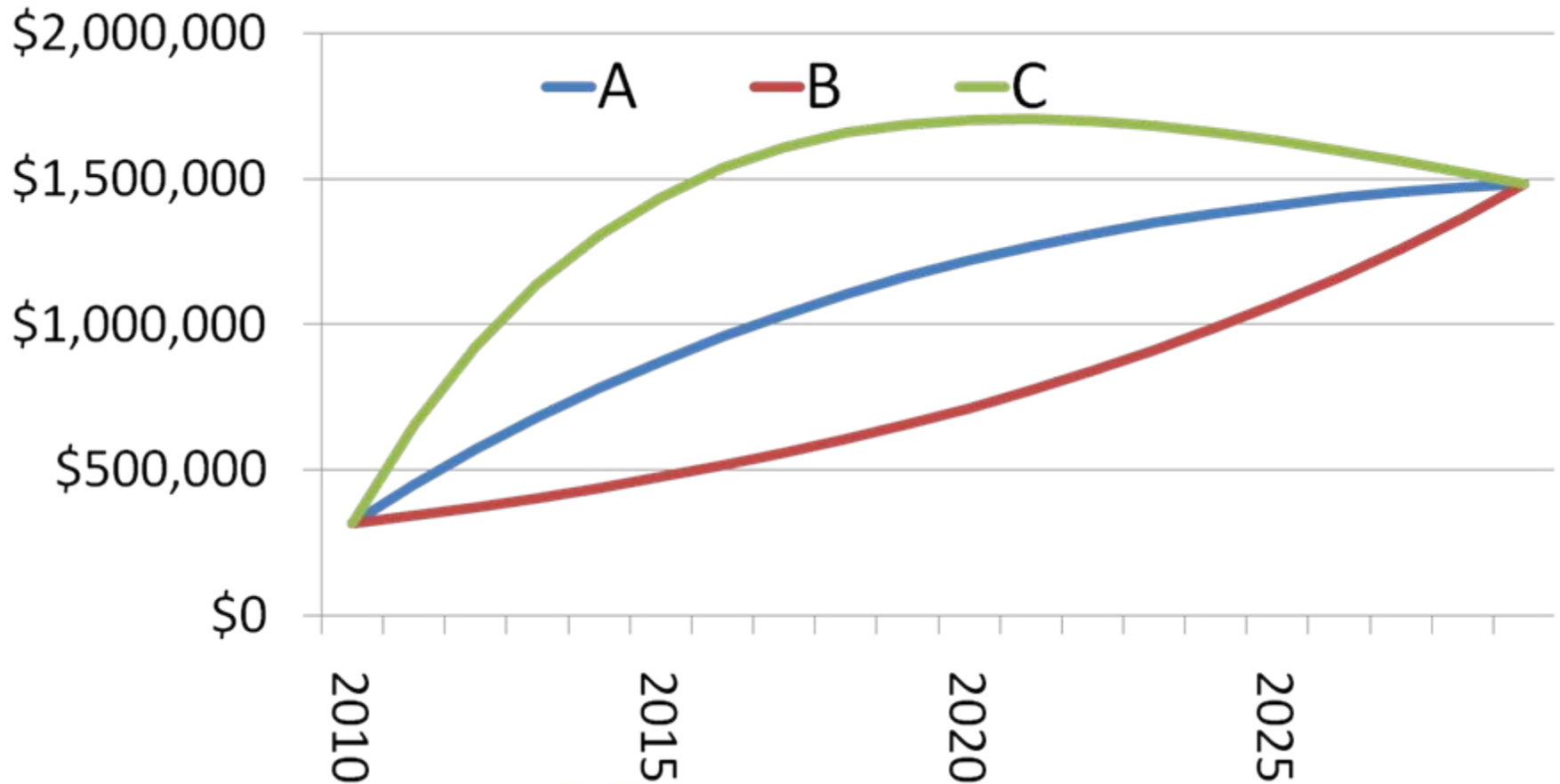
Project Revenue

NPV(mill\$): A= \$14.5; B= \$9.9; C= \$19.5



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Fixed Price v. Royalty, NPV

Carbon Price	15% Royalty	\$6/ton
A	\$2.2 mill	\$2.0 mill
B	\$1.5 mill	\$2.0 mill
C	\$2.9 mill	\$2.0 mill

The Analysis Method

- Model Uncertainties as Variables
 - Range of gas flow, system cost, assets' price
- Distribute Cash Flow per Proposals' Terms
- Factor Risk-Adjusted Net Present Value (NPV)
 - Discount rate increases with cash-flow volatility
- Determine Offers' Sensitivity to Uncertainty
 - Use slope of NPV across range of uncertainties

Lessons & Aggravations

- Landfill Owners:
 - Prioritize & Negotiate
- Landfill Developers:
 - Profit requires risk
- Engineers:
 - The problem, or the solution...

Thank you

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