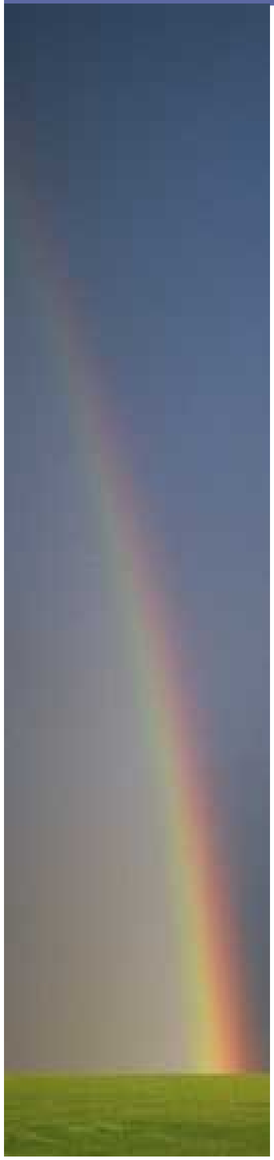
Offsets System Transaction Costs

Presentation to
Forestry and Agriculture GHG Modeling Forum
October 14 2004, Shepherdstown, WV

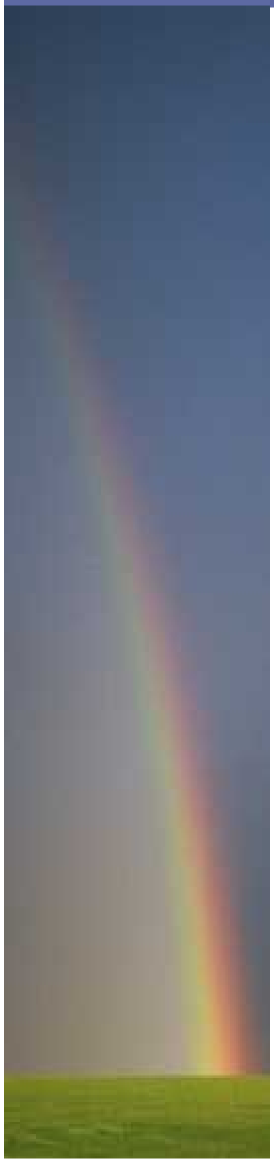
by Robert Flick
Agriculture and Agri-Food Canada



CASE STUDY #1

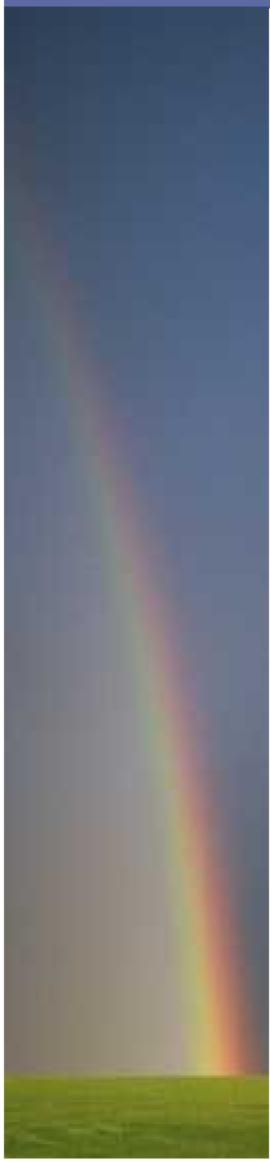
- **Mitigation practice:** **Soil Carbon Management**
- **Location:** **Canadian Prairies**
- **Program:** **Domestic Offsets System**
- **Implementation Issue:** **Transaction Costs and Design Options**

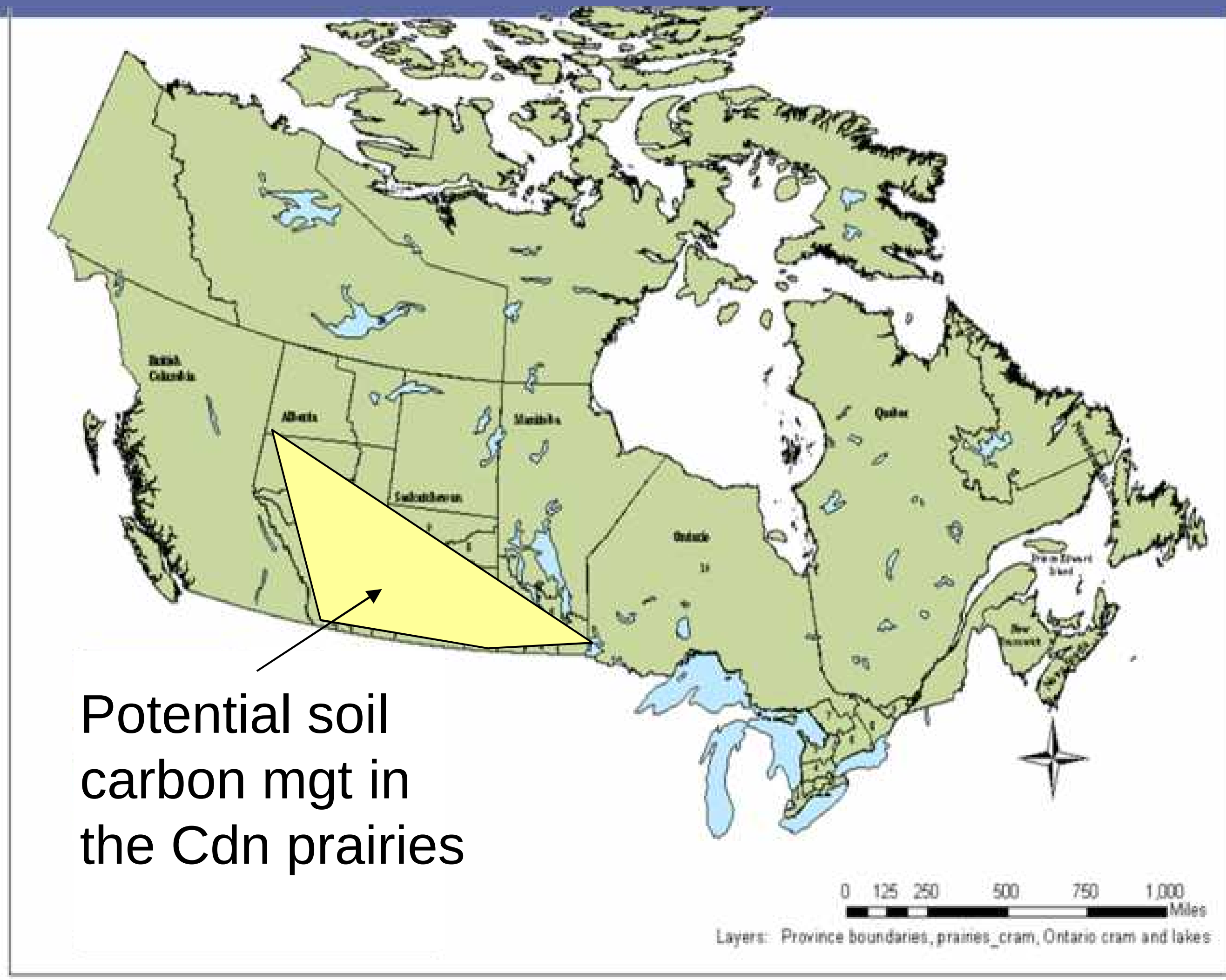
Presentation Outline



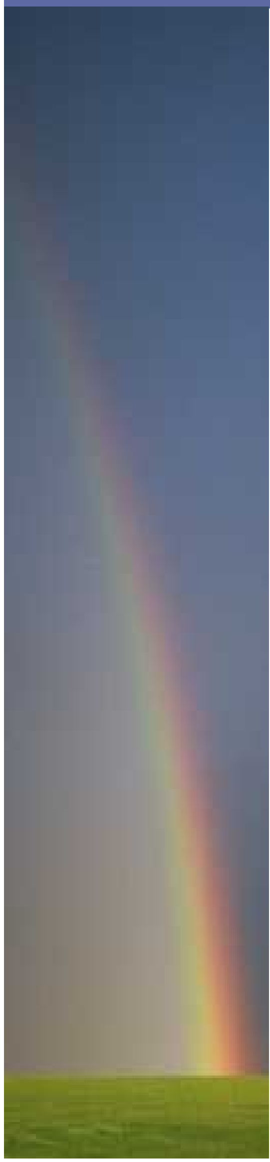
- Introduction: soil carbon management in the Prairies
- Overview of the proposed incentive program
- Design objectives and strategy for the Offsets System
- Study to estimate transaction costs associated with alternate design strategies
- Implications for the Offsets System design

Prairie Region for Soil Carbon Management



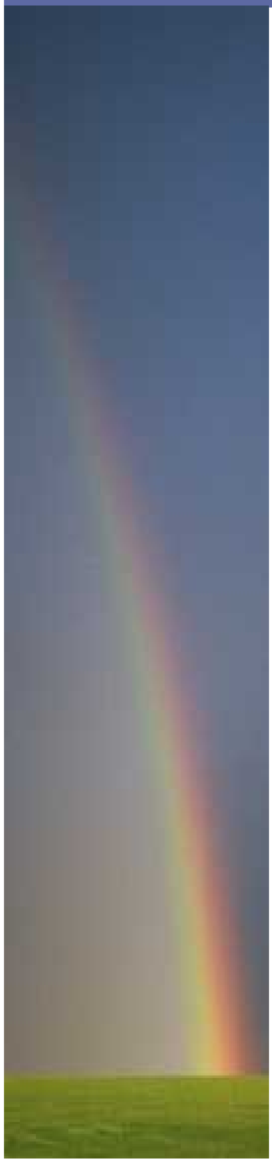


Prairie Soil Carbon Management in the GHG Offset Project Typology



Forests	GHG Removals	Afforestation Reforestation Forest Management
	GHG Reductions	Avoided Deforestation Forest Management
Agriculture	GHG Removals	Cropland Management ⌡ Increase No-Till ⌡ Decrease Summer Fallow ⌡ Increase Permanent Cover ⌡ Agro-forestry, Shelterbelts, Plantation Forests Grazing Land Management ⌡ Improved Grazing
	GHG Reductions	Crop Nitrogen Management Crop Nutrient Management Livestock Feeding Management Manure Management
Fugitive Emissions	Landfill Gas	Landfill Gas Capture & Flaring
Energy	Energy – Renewables	Small Hydro Wind Biomass Landfill Gas Capture & Use
	Energy Efficiency	Buildings Other DSM
Other	Transportation	Fuel Switching Engine Efficiency

Prairie Soil Carbon Potential



- **Government of Canada's Climate Change Plan has 3 step approach for achieving Canada's Kyoto target of 240 Mt CO2e reductions**
- **Step 1: 80 Mt from actions underway**

  ~10 Mt estimated from Business-As-Usual (BAU) Agricultural Sinks

  ~5.8 Mt of this from existing targeted measures (AP2000, APF and Greencover)

- **Step 2: 100 Mt from specified new actions**

  Part of the Plan proposes market-based incentives for GHG reduction and removal projects in a voluntary Offsets System

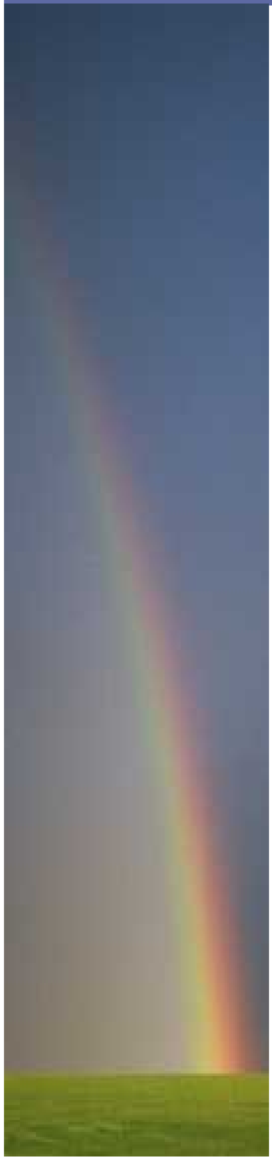
  potential for 20-28 Mt from Offsets (mostly forest and agriculture sinks)

  ~10Mt of these Offsets estimated to come from additional Agricultural Sinks

- **Step 3: 60 Mt from actions under consideration**

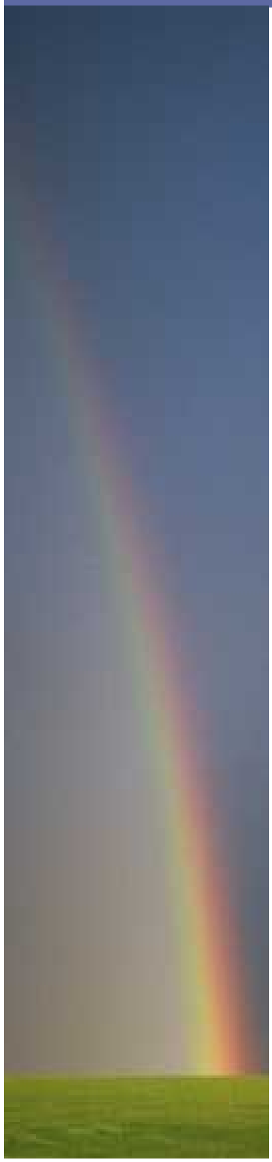
  ~no specific contributions identified as from agriculture

Incentive program for soil carbon management: Offsets System



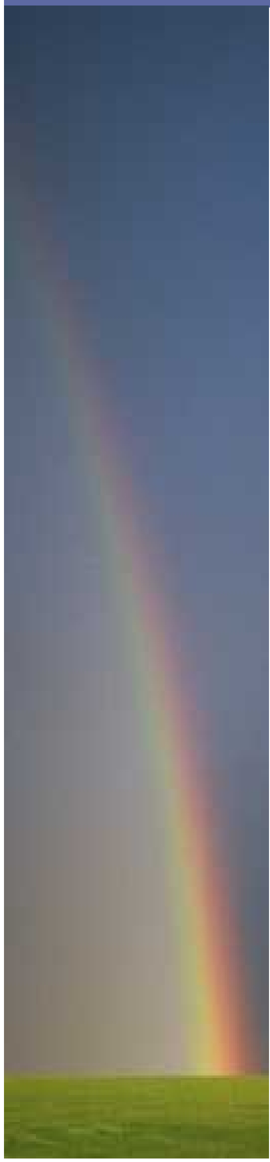
- **An Offsets System would provide a *<u>market-based incentive</u>* identify and develop projects to reduce GHG emissions not covered under the “Large Final Emitter” (LFE) system**
- **Large Final Emitter system will have mandatory emissions caps**
- **LFEs can then either do their own emissions abatements, purchase emissions permits from other LFEs, purchase other international compliance units, or the *<u>LFEs can purchase domestic offset credits</u>* in the Offsets System**
- **Offset projects are *<u>voluntary opportunities for agricultural producers</u>* to implement practices that reduce/remove GHG’s**
- **Producers would sell the *<u>certified</u>* offset credits to LFE’s**
- **Offsets System is intended to provide an incentive to increase Best Management Practices beyond what would be expected to occur without the Offsets System**
  - ***<u>i.e. Offsets must be beyond a Business-As-Usual baseline</u>***
- **Offsets System would *<u>encourage innovation</u>* & entrepreneurial emission reduction projects**

Design Objectives for an Offsets System



- Want the system to be:
  - ***Effective*** in achieving real GHG reductions
    - » System must have environmental and economic integrity
    - » System must go beyond business-as-usual GHG reductions and removals
  - ***Efficient*** in how the system achieves those reductions
    - » System must be practical and have viable economics
    - » System must minimize transaction and administrative costs
  - ***Equitable*** in how the rules treat different sectors, stakeholders and potential project proponents
    - » System must be fair

Design Strategy to meet the Offsets System Objectives:



- **To be effective the system *must have eligibility criterion* to validate, verify and monitor offset projects**

- **The eligibility criterion proposed for the Canadian offsets system are that a project's GHG reductions/removals must be:**

1. *Included in Canada's GHG Inventory for Kyoto reporting*

2. Real net reductions of atmospheric GHG's

> **Reductions/removals must be the net of all GHG changes (CO2, CH4, N2O)**

> **Reductions/removals must be net of measurable off-site leakage that is directly attributable to the project**

3. *Quantifiable and Verifiable* GHG changes from a baseline

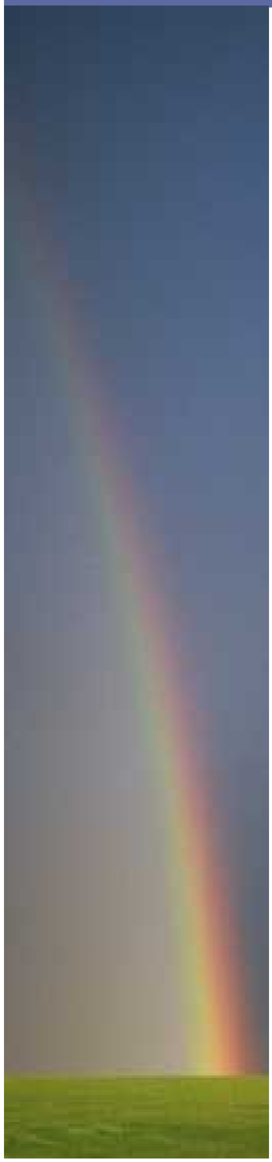
4. *Occurring in 2008-2012* (1st Kyoto Commitment period)

5. From a project practice *Started after Jan 1, 2002*

6. *Surplus* to reductions/removals due to other government climate change measures

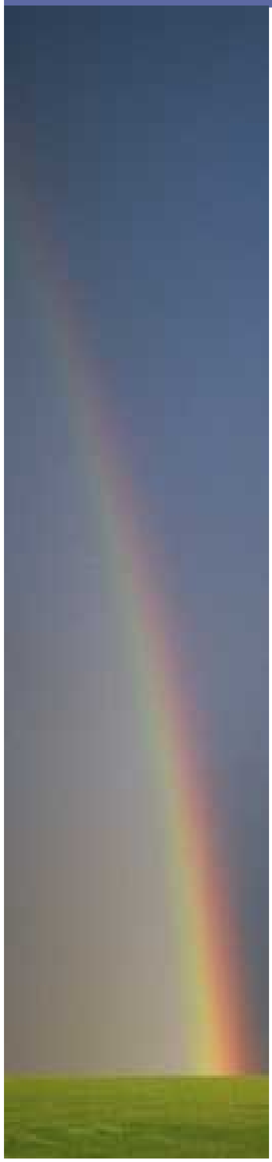
7. *Unique* GHG reductions/removals with clear *Ownership* that are only used once for GHG inventory or compliance reporting

Design Strategy con't:



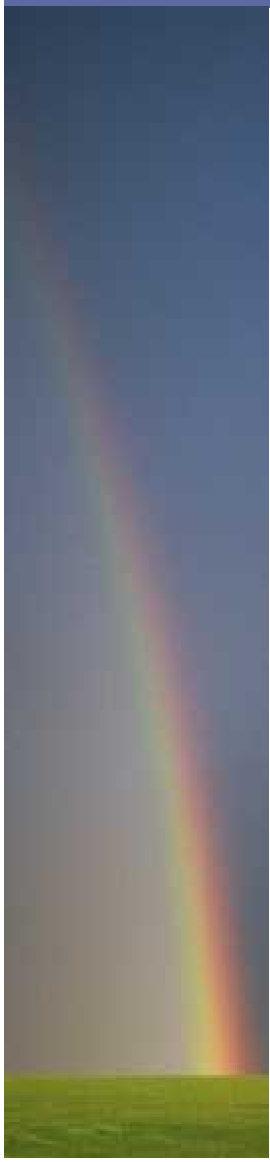
- In addition to being effective the ***system must be efficient***
- The system must have practical and viable transaction and administrative costs
- ***Need low transaction costs for agricultural sinks projects*** because these projects are expected to have ***marginal economics***
  - ***Extra costs due to the potential non-permanence of soil sinks***
    - > discounted annual temporary offset credits from sinks (one-year carbon storage credits to be used by LFEs for one year compliance deferral)
    - > or, a long-term carbon maintenance contract for one permanent credit
  - ***Low carbon sequestration rates*** requiring significant areas of land (~1.0 tonnes/hectare) to produce offset credit supply
- ***<u>To design an efficient system we need to optimize the eligibility criterion</u>***
- Need to keep in mind that there are ***trade-offs***
  - For example, ***increasing the <u>effectiveness</u>*** of the quantification criterion ***also reduces the cost per tonne <u>efficiency</u>*** of the reductions achieved
  - Objective is to find an optimal balance between an effective and efficient Offsets System

Transaction Costs Study



- To help understand the design variables that affect the effectiveness and efficiency objectives the federal Working Group on Offsets commissioned a study:
  - "Potential Administration and Transaction Cost Estimates for a GHG Offsets System" (by Marbek Resource Consultants) (available at www.climatechange.gc.ca)
- Study Objectives:
  - Identify and estimate potential transaction costs to proponents associated with participating in an offsets system
  - Identify and estimate potential administrative costs to the government associated with setting up and operating an offsets system
  - Suggest ways that administration and transaction costs may be reduced through design options
- Study methodology:
  - Contractor clarified key cost drivers expected for the proposed offsets system
  - Contractor reviewed existing documentation and literature on potential administration and transaction costs for the key design elements
  - Contractor conducted interviews with stakeholders and experts (both domestic and international) to determine potential cost ranges for the key proposed design elements of the system
  - Data was then compiled into cost ranges for the key design elements using a statistical sampling methodology

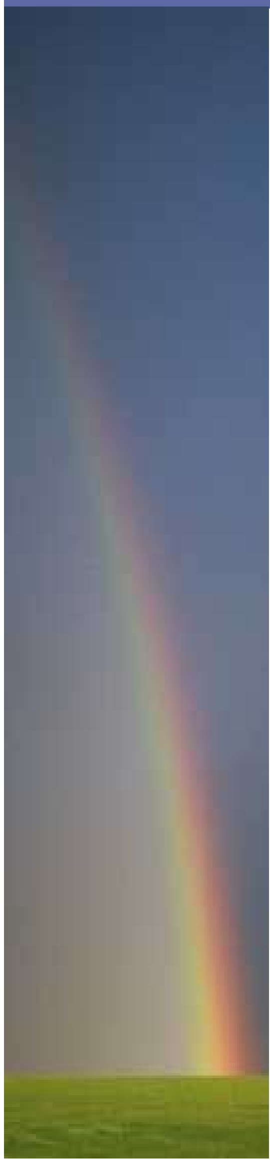
Design Variables with Efficiency Options



Key Design Variables with Administration and Transaction Costs

Category	Administration Cost Elements	Transaction Cost Elements
One-Time Costs	**SET-UP PROGRAM AUTHORITY** **DEVELOP LEGAL FRAMEWORK** **DEVELOP PROTOCOLS AND GUIDANCE** **PUBLIC CONSULTATION ON PROTOCOLS** **ESTABLISH ACCREDITATION PROCESS** **ESTABLISH DISPUTE RESOLUTION PROCESS** **ESTABLISH PROJECT REGISTRY**	**PROJECT EVALUATION** **PROJECT INITIATION** **PROJECT PROPOSAL** **PROPOSAL VALIDATION**
Ongoing Costs	**BASE OPERATING COSTS** **CONDUCT OVERSIGHT/AUDIT** **OPERATE REGISTRY**	**EMISSIONS R/R QUANTIFICATION** **EMISSIONS R/R VERIFICATION** **EMISSIONS R/R MONITORING & MANAGEMENT OF NONPERMANENCE**

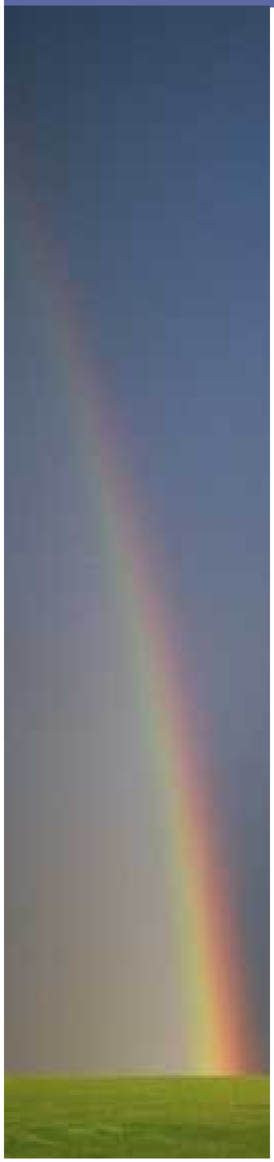
Scenarios to Evaluate the Key Cost Drivers



- **Three general scenarios were chosen to evaluate the key cost drivers identified for the design variables: Limited, Medium, & Broad approach to design variables**
- **Limited Approach to the design is very rigorous (effective) but limits participation (eg.higher cost)**
- **Broad approach to the design encourages more participation (efficient) but is less rigorous**

Key Cost Driver (below)	Limited Scenario	Medium Scenario	Broad Scenario
Sectoral Scope (Complexity)	NARROW: Agriculture, Forestry and Landfill Gas only	All sectors, except renewables and energy efficiency	BROAD: All sectors
BBQ: Baselines, Boundaries and Quantification	More precise bottom-up approach (eg. High Sampling Measurement of Carbon Levels)	Hybrid approach	Less precise top-down approach (eg. Model Interpolations of carbon changes based on the management practices)
Verification	Reductions: • Non-expiring credits – annual Removals: • Non-expiring credits – annual	Reductions: • Non-expiring credits – annual Removals: • Non-expiring credits – annual • Temporary credits – 5 years	Reductions: • Non-expiring credits – annual Removals: • Non-expiring credits – 5 years
Pooling	Independent projects only	Choice of independent projects or pooling	Choice of independent projects or pooling
Surplus	Project surplus to all government regulations and climate change measures	Project surplus to federal regulations and climate change measures	Project surplus to federal regulations and climate change measures
Non-Permanence	Risk management plan (RMP) and required replacement (No GoC liability)	RMP and choice of required replacement or temporary credits (No GoC liability)	RMP only (GoC liability for reversals)

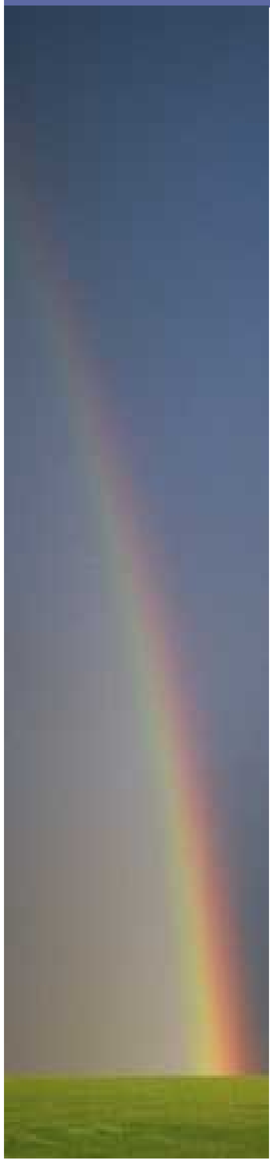
Summary of scenarios



- **Seven scenarios for agriculture (sinks focus): three approaches to quantitative rigor**
- **Two agricultural project sizes: small independent projects (1.4kt/yr) & large pool projects (246kt/yr)**
- **Two nonpermanence options: temporary credits (no maintenance liability) &“permanent credit” (long-term maintenance liability)**

Project Type	Scenario	Project Size (kt/year)	Pooling?	Option for Non-Permanence
Forests	Limited	20	No	Req. Replacement
	Medium	20	No	Req. Replacement
				Temp credits
		120	Yes	Req. Replacement
				Temp credits
	Broad	20	No	Risk Management
		120	Yes	Risk Management
Agriculture	Limited	1.4	No	Req. Replacement
	Medium	1.4	No	Req. Replacement
				Temp credits
		246	Yes	Req. Replacement
				Temp credits
	Broad	1.4	No	Risk Management
		246	Yes	Risk Management
Landfill Gas	Limited	125	No	N/A
	Medium	125	No	N/A
	Broad	125	No	N/A
Renewables	Broad	100	No	N/A
Energy Efficiency	Broad	10	No	N/A

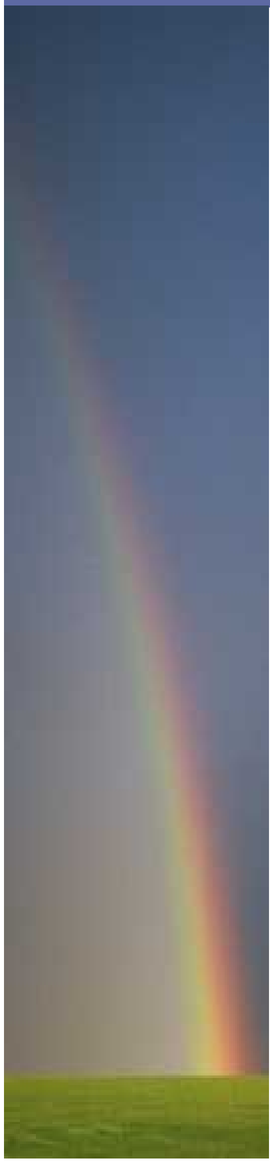
Transaction Cost Estimates ($000) for an Example Design Variable: Quantification



- **This is one table showing the study's results for one design variable; additional data tables were compiled for each design variable**
- **The transaction costs range for quantification for agriculture were $1k-$30; shows significant potential to reduce costs using the alternate quantification methods, but the effect of the scenarios need to be considered on all design variables**

Scenario	Range	Agriculture		Forestry		Landfill Gas		Renewables		Energy Efficiency		Other	
		1st yr	2nd yr	1	2	1	2	1	2	1	2	1	2
Limited	Low	10	7.5	10	5	2.5	1.5	N/A		N/A		N/A	
	Mode	15	12.5	15	7.5	5	2.5						
	High	30	25	50	25	7.5	5						
Medium - without Pooling – Req. Replacement	Low	2	2.5	5	2.5	1	1					5	2.5
	Mode	3	5	7.5	5	2	1.5					15	7.5
	High	7	7.5	10	7.5	5	2					25	15
Medium - without Pooling – Temporary Credits	Low	1	1	2.5	1	N/A							
	Mode	2	2.5	5	2.5								
	High	6	5	7.5	5								
Medium - Pooling – Req. Replacement	Low	10	5	7.5	2.5								
	Mode	10	10	10	5								
	High	15	15	12.5	7.5								
Medium - Pooling – Temporary Credits	Low	3	5	5	2								
	Mode	8	7.5	7.5	3								
	High	12	10	10	5								
Broad - without Pooling	Low	3	2.5	7.5	2.5	1	1	1	1	1	1	5	2.5
	Mode	5	5	10	5	2	1.5	2	1.5	2	1.5	15	7.5
	High	9	7.5	12.5	7.5	5	2	5	2	5	2	25	15
Broad - Pooling	Low	7	7.5	10	5	N/A		N/A		N/A		N/A	
	Mode	12	12.5	12.5	7.5								
	High	18	15	15	10								

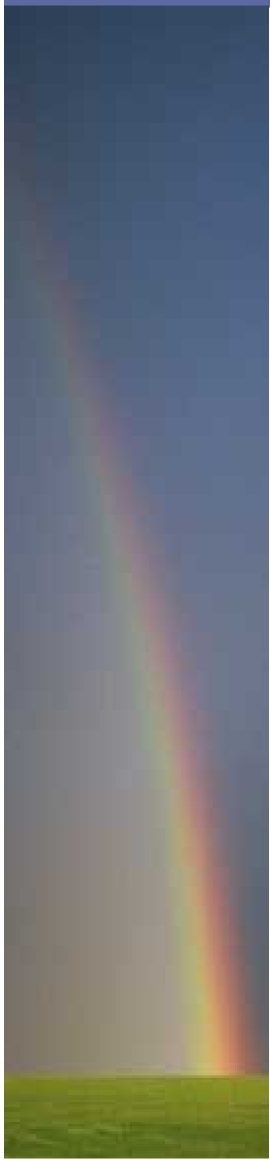
Summary Transaction Cost Estimates for Agriculture (Prairie soil sinks focus)



- **This table summarizes the <u>estimates of total transaction costs for agricultural sinks projects under the alternate design scenarios</u>**
- **These are <u>total costs per project per year, not costs per tonne</u>**
- **Shows example total transaction cost ranges:**
  - **$6k-$11k per project per year (4-8$/tonne) for a small independent project with moderately rigorous quantification, verification and monitoring,**
  - **$61k-$94k per project per year (0.25-0.38$/tonne) for large pooled projects with a broad approach to quantification, verification and monitoring**

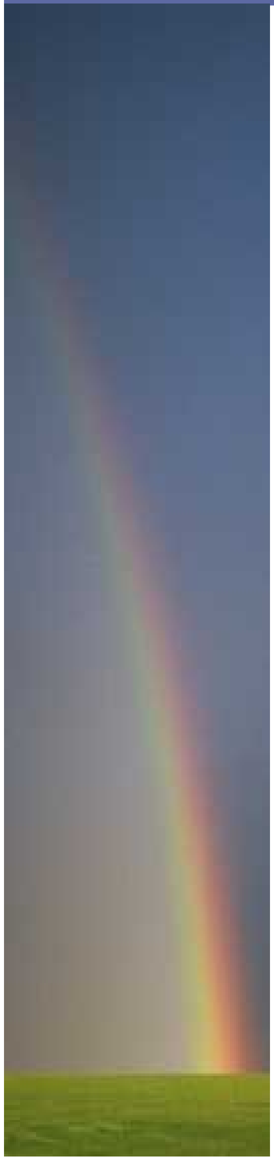
Project Type	Scenario	Project Size (kt/year)	Pooling	Non-Permanence	Total Cost ($000)		
					L	M	H
Agriculture	Limited	1.4	No	Replace	51	61	72
	Medium	1.4	No	Replace	15	19	23
				Temp.	6	9	11
		246	Yes	Replace	112	125	137
				Temp.	37	48	59
	Broad	1.4	No	Risk Mgmt	16	19	22
		246	Yes	Risk Mgmt	61	78	94

Summary of Transaction Cost Study Estimates:



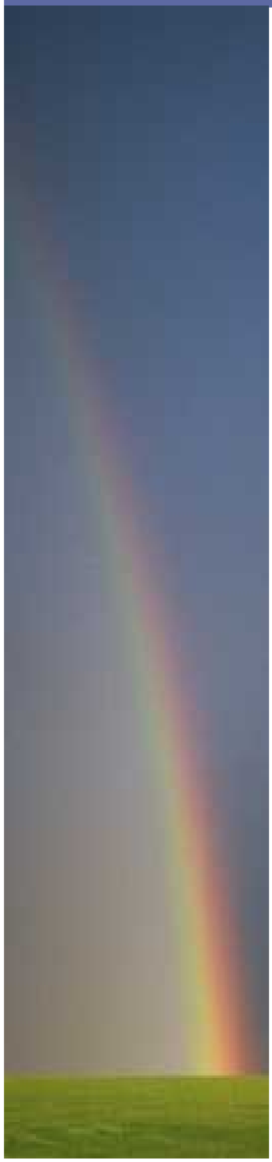
- Estimated total Offsets System costs (aggregated across all sectors, including both transaction and administrative costs):
  - Limited Scenario (project by project baselines, limited scope, independent projects): $1.54-1.74/tonne
  - Medium (hybrid) scenario: $0.46-0.60/tonne
  - Broad Scenario (top-down baselines, broad scope, pooling): $0.38-0.44/tonne

Design lessons from a Prairie soil sinks perspective

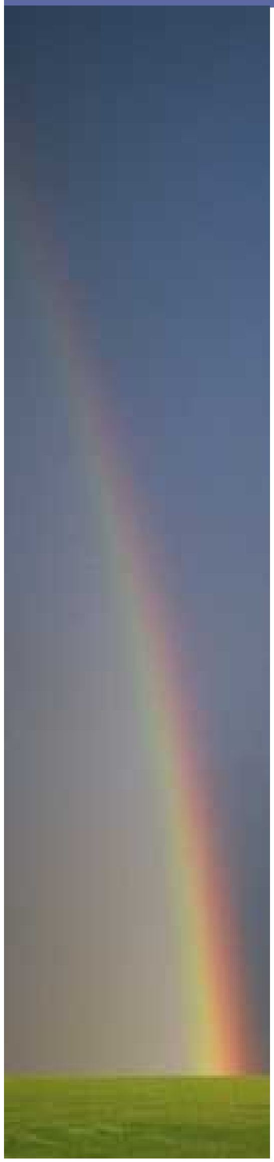


- **Small independent agricultural sinks projects could face high costs per tonne to certify and administer an offsets project**
- **Broad, top-down approach to quantification reduces costs per tonne but requires a conservative approach to estimating sequestered tonnes**
- **Broad, practice-based approach to verification and monitoring reduces costs per tonne**
- **Pooling could have significant economies of scale and thus reduce the project transaction and administrative costs per tonne**
- **Specific design variable choices depend on the project type--no one approach suits all projects**
    - **Offsets System needs to have consistent rules for a wide range of project types and project locations**

Design implications:



- **Allow choice between pooled projects and independent projects**
  - > **specific project protocol streams for each**
- **Allow choice between quantification protocols for independent projects**
  - > **less rigorous and lower cost methods would have more conservative estimates of tonnes sequestered**
- **Allow practice-based verification and monitoring for agricultural sinks projects (not carbon level verification)**
  - > **annual check/audit of adherence to the project practice**
  - > **annual audit is only for a sample of all sinks projects**
- **Allow choice between approaches to management of non-permanence**
  - > ***Temporary Credits***
  - > **“permanent” *Offset Credits***
    - » **with the opportunity to insure for natural reversals**



Welcome your comments and questions.

Thank-you