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Climate change on the ground: The economic tools

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Carbon offsets programs, a policy breakthrough or dead end? Learning from Alberta

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Emerging federal and provincial mitigation regimes

Early voluntary programs failed to curb emissions

Regulatory approaches now emerging at national/provincial levels:

‘Market-based’ or economic tools (carbon pricing)

- cap and trade systems (federal, Alberta and WCI partners)
- carbon taxes (Quebec and BC)

Direct regulation

- federal fuel efficiency standards
- provincial energy regulation (portfolio standards)
- more....

Alberta cap and trade system a pioneer

Importance of local action

Municipal control of GHG emitting activities

- Direct: 6% of Canada's GHG emissions (25% of methane)
- Indirect (transportation, LUP): at least 50% (*FCM 2007*)

Strength of local government tools, especially land use planning

- Demand-side, structural
- Long term
- Compulsory

Experience and competence of local government

Site of innovative and leading institutions and projects

Research question

In choosing a cap and trade regime and in its design of that system, is Alberta fully engaging local governments and enabling the full range of local actions available to reduce GHG emissions, including those in the realm of land use planning?

Methodology

Review and analysis of relevant documents, including:

Alberta's Climate Change and Emissions Management Act

Alberta's Specified Gas Emitters Regulation and related official guidance reports
offsets project data from the offset registry

offsets protocols and other documents by Climate Change Central

academic literature on performance of carbon offsets and cap and trade systems

NGO reports.

Interviews:

Offsets Program Manager, Alberta Climate Change Central

Policy Analyst, Alberta Climate Change Central

Land use planner, City of Edmonton

Policy Analyst, Edmonton Environment

Lead, Climate Change and Air Quality, Calgary Environmental and Safety Management

Coordinator, Alberta Municipal Climate Change Action Center

Key principles (Alberta offsets program)

Administratively Simple

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Maximum Scope

the Offset System should, over time and to the extent practical, promote and **enable projects in all sectors** and of all types and size;

Building and Linking

...

Transformational Change

the design should support **transformational change across all sectors** of the economy and society in such a way that emission reductions and removals are a part of daily decision-making by Albertans. This change will be enabled, in part, by the deployment of proven, enhanced and innovative technologies with support from public education, regulatory and other policy direction to drive the behaviors necessary to contribute to overall reductions.

Environmental Benefits

the design must ensure project-based emission offsets result in further reductions and removals in greenhouse gas emissions, than would be the case if offset credits were not available. **Other environmental benefits** can be addressed when considering project eligibility.

Transparency and Accountability

...

Offset project eligibility (Alberta)

Requirements

- only activities in Alberta and only those after Jan 1, 2002
- reductions must be real, demonstrable, quantifiable
- reductions verified by third party
- project activities not be required by law
- have clearly established ownership
- credits only count once

Calculation of offsets reductions (Alberta)

Protocol requirement

must be pre-approved

account for all sources and sinks, inception to decommissioning

baseline types:

historic benchmark

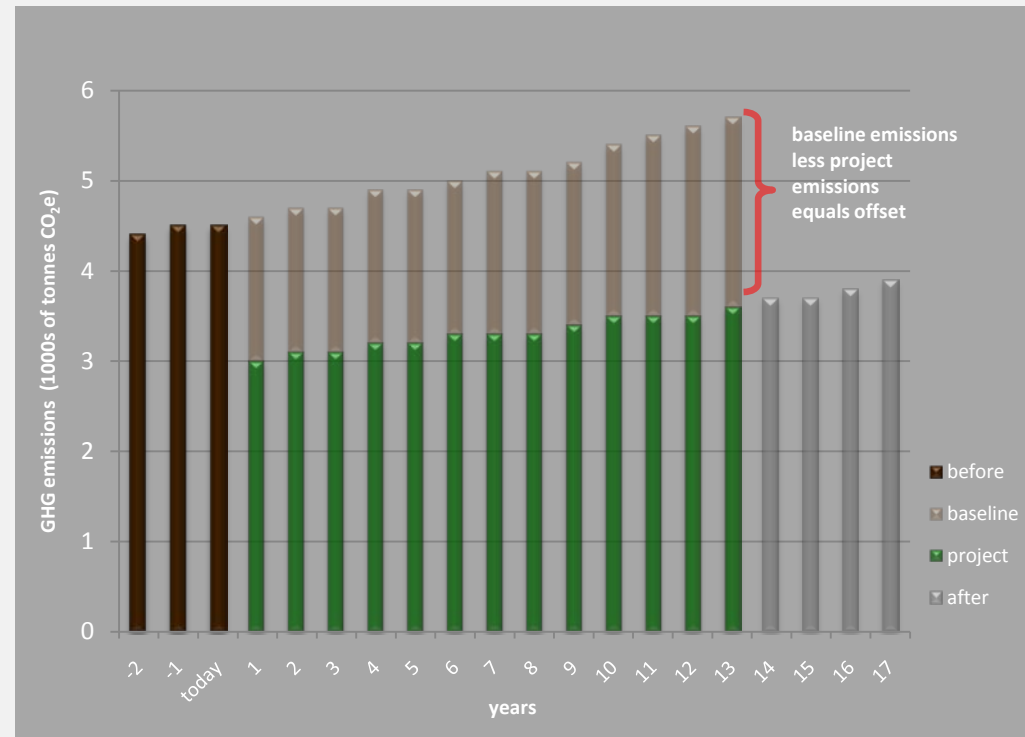
performance standard

comparison approach

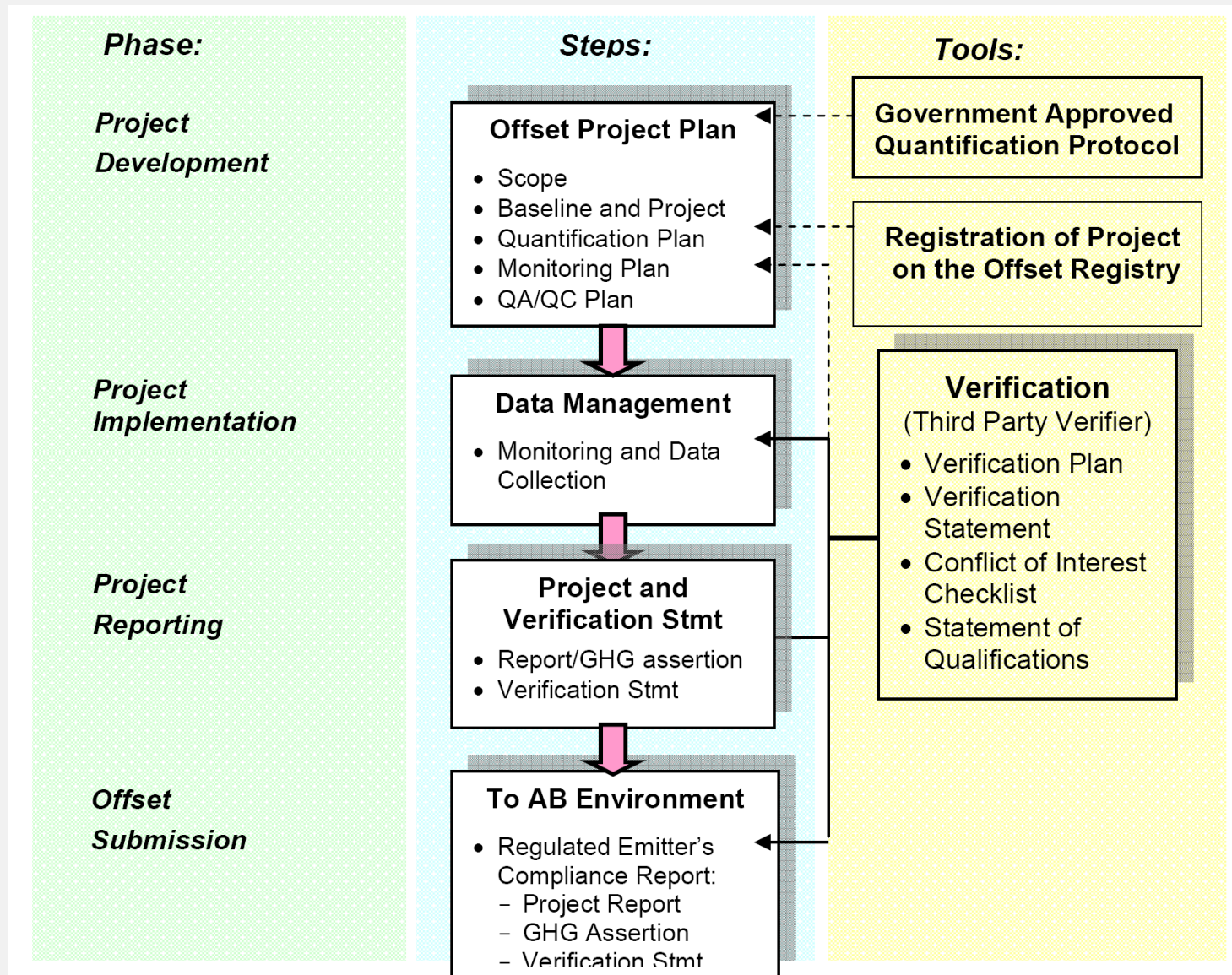
projection based

adjusted baseline

(Alberta Env 2008)



Phases of an offset project (Alberta)



Potential for municipal participation in offset programs

Sectors

waste related emissions
urban forestry
transit and municipal fleet
building energy efficiency

Potential benefits:

new revenue opportunities
carbon financing mechanism
access and linkages to global carbon markets
capacity building

Activities

Landfill gas capture/destruction
Demand-side management in municipally owned buildings;
Retrofit of municipal buildings;
Energy efficiency improvements in municipal buildings;
Fuel switching and vehicle upgrades in municipal fleets;
Improved management of municipal solid waste;
Improvements in management of agricultural waste;
Improvements in wastewater treatment;
District heat /district energy projects; and
Municipal street light upgrades/replacements.

(FCM 2007)

Overall results to date (Alberta offsets program)

More than 10 MT of CO₂e in reductions credited to offsets projects

Dozens of transactions

Credit prices rising (now averaging \$10 to \$14.50 per tonne)

Offset market a significant and growing compliance option

	compliance type			
period	internal fixes	emissions trade	offset credits retired	contribution to fund
2007 (1/2 year)	1.7 MT	1 MT	1 MT	\$40 M
2008	1.89 MT	1.9 MT	2.75 MT	\$83 M
2009	1.4 MT	1.2 MT	3.83 MT	\$62 M

(Offset Registry 2010)

Municipal participation to date (Alberta offsets program)

But, municipal participation has been extremely limited
Very few projects developed by municipalities or involving public assets

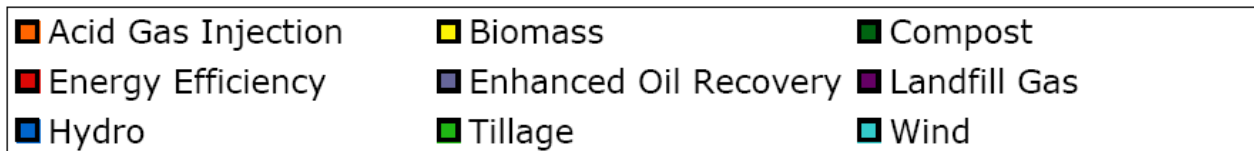
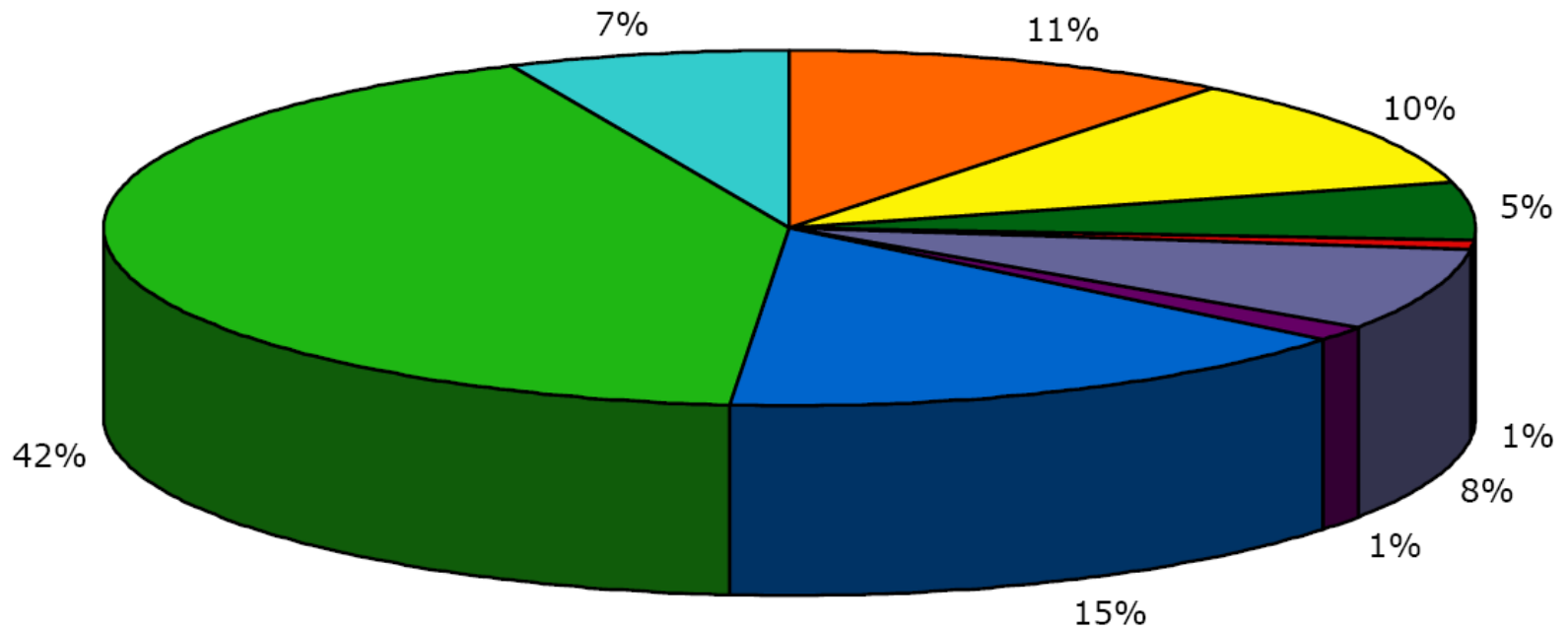
municipal offsets projects

of 63
projects
to date

only one landfill gas capture project
few wind farms
two composting facilities (only one generating credits)
only one building energy efficiency project (no credits to date)
no urban forestry projects
no public wastewater treatment project
no road rehabilitation project
no waste water treatment

(Offset Registry 2010)

Project types



Project types

	2007	2008	2009
number of projects	7	29	26
Project types	wind 45% landfill gas 31% tillage 21% biomass 3%	tillage 42% hydro 15% acid gas injection 11% biomass 10% enhanced oil recovery 8% wind 7% compost 5% landfill gas 1% energy efficiency 1%	tillage 38% wind 12% landfill gas 9% energy efficiency 7% compost 7% biomass 7% run of river 2%

(Offset Registry 2010)

The success story

Site:

City of Edmonton Waste Management Center (composting) and nearby Clover Bar Landfill Gas Generation Station (by CP Energy Marketing LP, successor to EPCOR)

Landfill gas portion:

potential credits > 1,200,000
credits sold to date > 650,000

Composting portion:

credits sold to date > 288,000



Roadblocks to municipal participation

Lack of quantification protocols

AGRICULTURE - LIVESTOCK (Feed, manure and soils)

Beef Feeding (Edible Oils), Beef Feeding (Reducing Days-On-Feed), Beef Lifecycle, Dairy Cattle Emission Reduction, Pork Quantification Protocol, Biogas Quantification Protocol, Tillage

ENERGY EFFICIENCY

Energy Efficiency, Engine Fuel Management and Vent Gas Capture, Instrument Gas Conversion to Instrument Air, Waste Heat Recovery

FORESTRY

Afforestation (Retracted for revisions)

GEOLOGICAL SEQUESTRATION

Acid Gas Injection, Enhanced Oil Recovery

METHANE MANAGEMENT

Aerobic Composting, Landfill Bioreactor, Landfill Gas

RENEWABLE ENERGY

Biofuel, Biomass, Run-of-the-River Electricity System, **Solar Electricity Systems**, Wind-Powered Electricity Systems

TRANSPORTATION

Modal Freight Shift, **Road Rehabilitation**

WASTE MANAGEMENT

Non-Incineration of Thermal Waste, **Anaerobic Wastewater Treatment**

OTHER

Nitrous Oxide Abatement from Nitric Acid Production, Sulphur Extender in Asphalt Production and Use

Roadblocks to municipal participation

Difficult to develop new protocols

expensive

time consuming

no guarantees

Consultants attracted to projects with higher ROI potential

Roadblocks to municipal participation

Public sector offset projects riskier

- GHG reductions per project smaller (small municipalities/projects)

- Longer time to realise reductions

- High upfront costs (development, data management, verification)

- Considerable expertise, staff resources required

Aggregation essential

- Costly

- Difficulty in attracting aggregators

Roadblocks to municipal participation

Structural barriers

risk of future mandates creates uncertainty

governments is unlike other carbon market participants

project focus precludes programmatic approaches

quantification too strict for land use/energy modeling???

uncertain prospect of integration with other carbon markets

Preliminary conclusions

To date, Alberta's offset system has not attracted much municipal participation.

Barriers to municipal participation include lack of quantification protocols in areas of interest to municipalities and poor prospects for aggregation of projects.

The system does not accommodate well measures in the realm of land use planning in part due to need for strict quantification requirements.

Relaxation of requirements to promote municipal participation may (further?) compromise environmental integrity of cap and trade.

The low price of carbon at present suggests potential for offsets revenue is unlikely to have more than a marginal effect on a project business cases.

Avenues for continued research and analysis

Challenge to use of offsets

Attaching profit motive to GHG reduction above other considerations misses the complexity (multiple values) inherent in development decision and complex systems.

Is every tonne reduced the same as every other tonne?
In purest form, blind to other impacts of reductions

Nuclear power, biofuels, wind mills, pesticides to counter low tillage,
Need to consider adaptation AND mitigation together.

How to reform system to favour other environmental benefits?

Risk of carbon leakage and phantom reductions – use only as a temporary measure

Potential anti-regulation effect of offset system???

Selected references

- Whitmore & Shariff 2007. Comments on Alberta's *Offset System Project Guidance Document* (draft), dated June 20, 2007, The Pembina Institute and the Toxics Watch Society of Alberta (2007). Available at <http://pubs.pembina.org/reports/Comments-Alb-offset.pdf>.
- FCM 2007. "Canada's Regulatory Framework for Air Emissions: Opportunities and Challenges for Canadian Municipalities." Ottawa, ON (2009) available at <http://www.fcm.ca//CMFiles/regframewrkemissions1PFT-5212009-1616.pdf>.
- Alberta Env 2008. *Offsets Credit Project Guidance Document*. Alberta Environment, Edmonton, AB (2008).
- Alberta Env 2009. *Second Review of the Alberta Offset System - 2008 Compliance Year*. Alberta Environment, Edmonton (2009). Available at: [http://carbonoffsetsolutions.climatechangecentral.com/files/microsites/Policy_Regulation/Offset_Workshop_06-09 - Audit_Results.pdf](http://carbonoffsetsolutions.climatechangecentral.com/files/microsites/Policy_Regulation/Offset_Workshop_06-09_-_Audit_Results.pdf)
- *Offsets Registry 2010*. Alberta Emissions Offset Registry. Climate Change Central (2010). Available at <http://carbonoffsetsolutions.climatechangecentral.com/offset-registry>.