

What is a protocol?



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Albertans taking action

Outline

- The Value of Standards
- The Role of Protocols
- C3's Role in the Alberta Offset System
- The Development of Protocols in the Alberta System



ISO

- International Standards Organization
- ISO 14064-1 – Organizational level reporting of GHG emissions
- ISO 14064-2 – Project level quantification and reporting of emission reductions and removals
- ISO 14064-3 – Validation and Verification of GHG Assertions



Why ISO?

- Internationally accepted
- Consistent and transparent
- Policy neutral
- Non-sectoral
- Verifiable
- Customizable



ISO 14064-2 Principles

- 1. Relevance** - select GHG sources and sinks, emission factors and formulae appropriate to the environmental integrity of the protocol.
- 2. Completeness** – should consider all relevant GHG emissions and removals. Relevant information used to support decisions made in the quantification process should be transparently documented.
- 3. Consistency** - to ensure meaningful comparison of GHG-related information. In particular, like emissions need to be compared in baseline and project scenarios – ‘Functional equivalence’.
- 4. Accuracy** - reduce bias and uncertainties as far as practical; rely on IPCC and National Inventory methods as much as possible.
- 5. Conservativeness** - conservative assumptions, values and procedures are used to ensure that GHG emission reductions or removal enhancements are not over-estimated.
- 6. Transparency** - present your calculations, assumptions and decisions in a clear, upfront manner that facilitates review by reviewers, interested parties, verifiers - ultimately the Regulator will need this to accept the protocols.



Standardizing Protocols

ISO/WRI Standard

System Rules

Protocol application

Project Plans



- Defines the Requirements
- Tells proponent what to do not how to do it
- Generic, non-sectoral

- OS Rules narrow down requirements
- Some procedures are given
- Sectoral

- 'Performance-based standard' approach: - simplified and prescriptive to achieve a certain level of performance
- Project Type
- Many criteria and procedures established and justified – the how to's

- Project specific
- Must show they meet the requirements
- Establish some criteria and procedures



Fundamentals of Offset Projects:

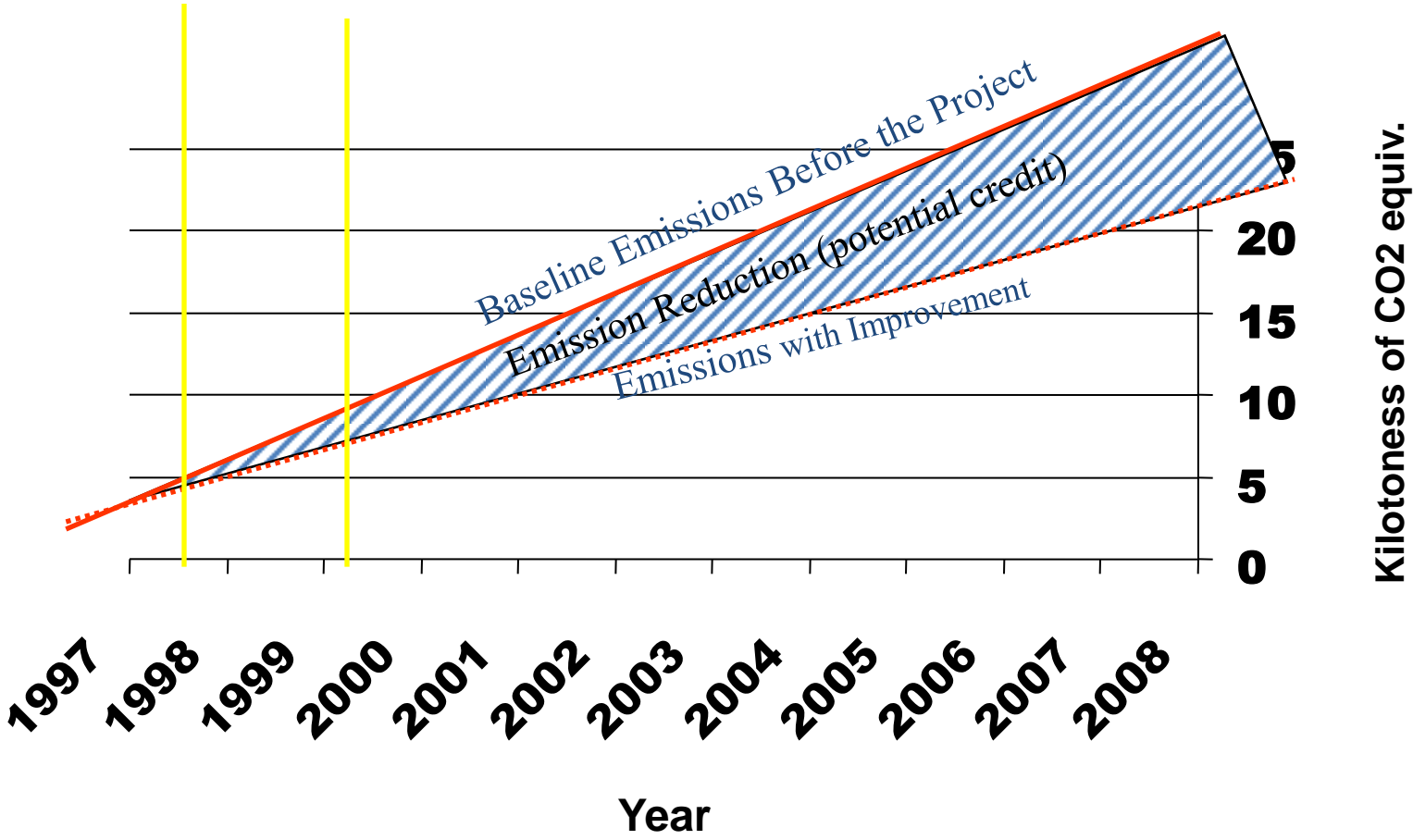
“Baseline - Project = Offset”

- Project Condition
 - What happens (GHGs) in the improved practice/new technology?
- Baseline Condition
 - What was happening (GHG emissions) in the old practice, or common industry practice before the change? Business As Usual Practice.
- Functional Equivalence
 - Are they comparable (same level of activity, product, service) to base calculations on?
- Evidence – Document it:
 - Quantification Plan
 - Monitoring/Reporting Plan
 - Data Management System and Data Controls (QA/QC)
- Amount of Offset Credits/Reductions or Removals =
Baseline - Project.

Need to quantify both!



What is a Project-Based Emission Reduction Credit?



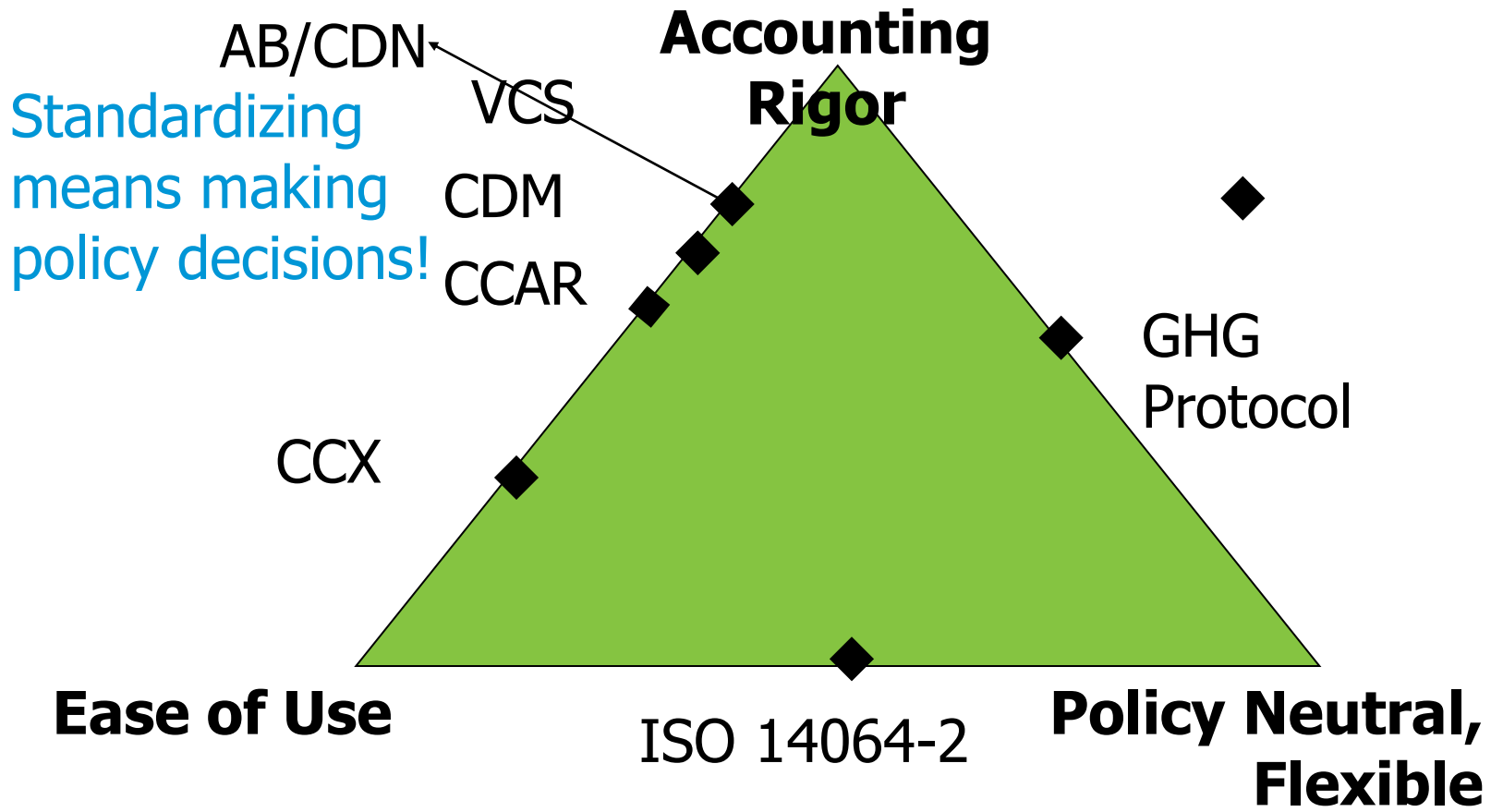
Why ISO 14064-2?

- ABOS is based on an International Standard*:
 - ISO 14064 Part 2 and 3
 - Streamlined Life Cycle Assessment of 6 gases
 - Identify the relevant GHG emissions controlled by the project
 - Also identify impacts outside the project
 - A relatively easy to use framework
 - Policy neutral, flexible
 - Remember: “what to do”

We want ‘Gold Standard Credits’!



Carbon Offset (Project-based) Accounting Standards



Why do we need protocols?



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What do protocols do?

- A Quantification Protocol allows project developers to **save costs and reduce risk** by ensuring greenhouse gas (GHG) reductions or removals quantified from a particular project-type meet all the requirements
- Protocol's provides **clarity and consistency** for measuring, monitoring and verifying emission reductions, and enhances the transparency, integrity and credibility of the Offset System.
- Provide a **set of unambiguous, verifiable requirements or specifications** to support organizations and GHG project developers
- Alberta's Government approved quantification protocols provide **calculations** and formulae to reliably quantify the reductions, using best available science.

Ensure that “a tonne of carbon is always a tonne of carbon”



What do protocols do? (2)

- ABOS protocols have been developed using the best available science for Alberta, good practice guidance, provincial/national expertise and experience gained through similar international projects.
- Protocols are useful to project developers who want to get started immediately, and also serve as guidance for those who want to develop quantification approaches unique to their circumstances in the future.



What do protocols do? (3)

- The protocols provide a **strong framework** to base the Offset Project Plan, with accompanying Quantification, Monitoring and QA/QC sub-plans. In addition, the verification process will be more efficient if the Verifier Company can reference an Alberta Offset Quantification Protocol applied to a specific Project.
- Government approved quantification protocols will provide the **credibility** needed in the early days of the market.



- Note: All Quantification Protocols approved under the *Specified Gas Emitters Regulation and Guidance Documents* are subject to **periodic review** as deemed necessary by AENV, and will be re-examined at a **minimum of every 5 years** from the original publication date to ensure methodologies and science continue to reflect best-available knowledge and practices.
- This 5-year review will not impact the credit duration stream of projects that have been initiated under previous versions of the protocol.
- Any updates to protocols occurring as a result of the 5-year and/or other reviews will apply **at the end of the first credit duration period for applicable project extensions**.
- Guidance Document revisions will apply as updated and it is the responsibility of the user to ensure they are using the most recent version any documentation.



A few last notes...

- Using a GOA approved protocol is a requirement for participation in the Alberta Offset System
- They are used by the verifier to ensure that a project meets ABOS criteria
- Protocols lay out the data requirements & help to define the size of the prize

The Role of C3

- **Emissions Offset Registry**

- Provide ongoing assistance and guidance with project developers and general stakeholders for registry functioning;
- Assist with registration, transfer, and retirement requests for government compliance ;
- Provide project registration documentation processing; communication with Project Developer; spatial location information; confirmation letters; updates to registry; tracking of information; and
- Assist Alberta Environment with compliance-related inquiries.

- **Carbon Offsets Solutions (COS) website** by maintaining and updating the website ensuring accurate and timely information is available.

- **Protocol Development** including the protocol review process as well as the protocol development process. Protocols continue to be developed in a number areas such as agriculture and forestry.

- C3 facilitates the protocol development Process
- Ensures transparency and Consistency

- **Alberta Offset System Support** - supports the Alberta Offset System through carbon market outreach, advice and support.



Alberta Protocol Development Process



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National Offset Quantification Team

- **Western Canadian Offset Team - 2002**
- **NOQT – 2003-2006; Fed-Prov-Territorial Committee**
 - **Mandate** -Identify, and prioritise GHG Quantification Protocols to support Offset System
 - Work as of 2006: Afforestation; Biogas, Land fill Gas, Ag Soil Sequestration, Biogas, Beef, Pork, Energy Efficiency, Intermodal
 - CFS started on FCM...



- The credibility of a protocol development process is vital to the long-term viability of the system.
- The development process and Alberta Protocol Format based on the ISO 14064-2 framework also includes expert engagement, defensible scientific methodologies, a rigorous peer review process, and documented transparency ensure a robust offset system that delivers real greenhouse gas reductions and net environmental benefits.



Criteria

- Result from actions taken on or after January 1, 2002
- Real, demonstrable and quantifiable
- Not required by law
- Have clear ownership
- Be counted only once for compliance purposes
- Be verified by a 3rd party
- Occur in Alberta



Basic Alberta Protocol Format

- Based on widely recognized and accepted International Standards for Environmental Management:
 - ISO 14064-2 Standard; Project-level quantification
 - Market access
- Protocols:
 - Describe practices/technologies that count
 - Provide quantification formula/coefficients to calculate emission reductions (Baseline-Project)
 - Describe data collection, how frequently etc.
 - Provides certainty

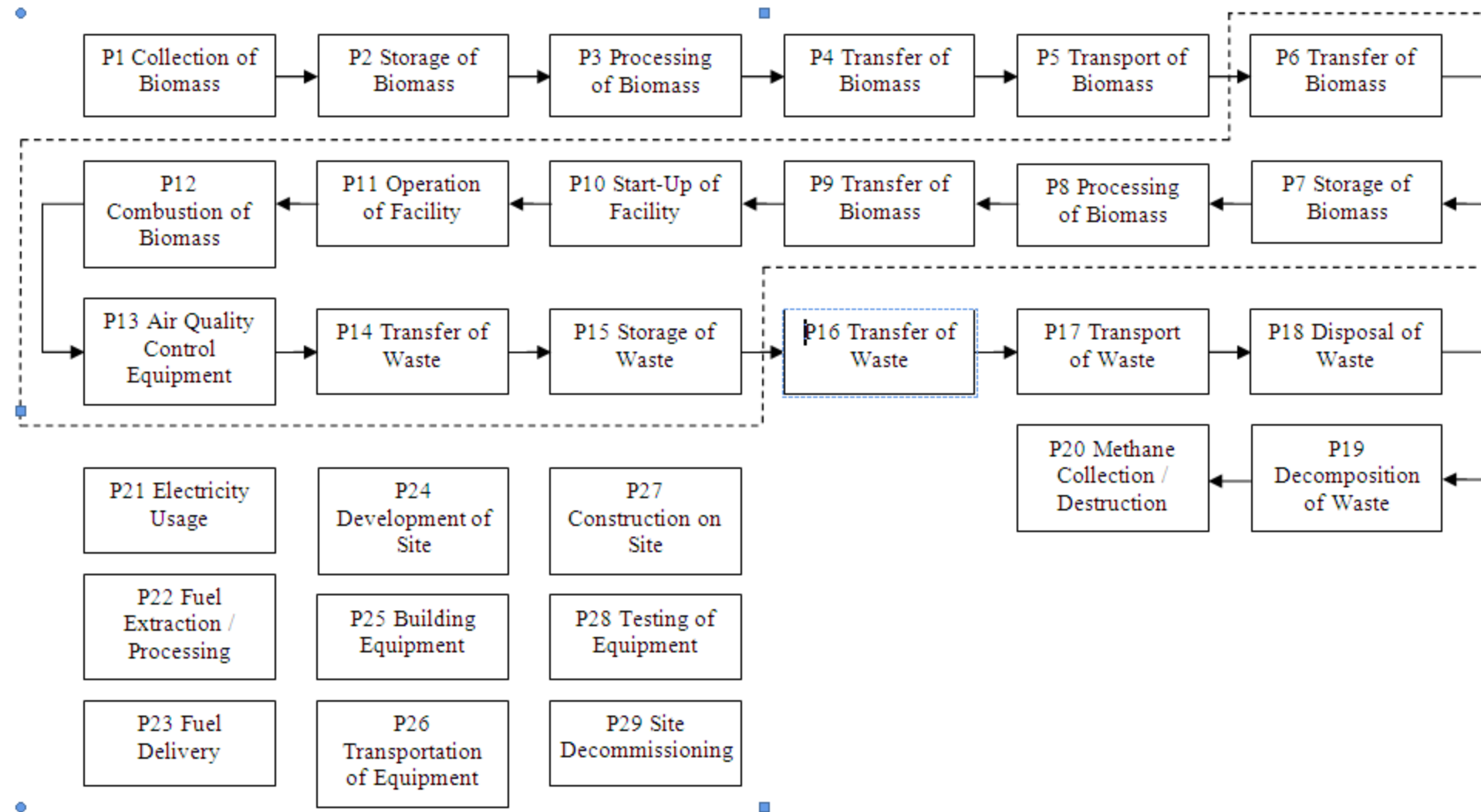


Parts of a Protocol

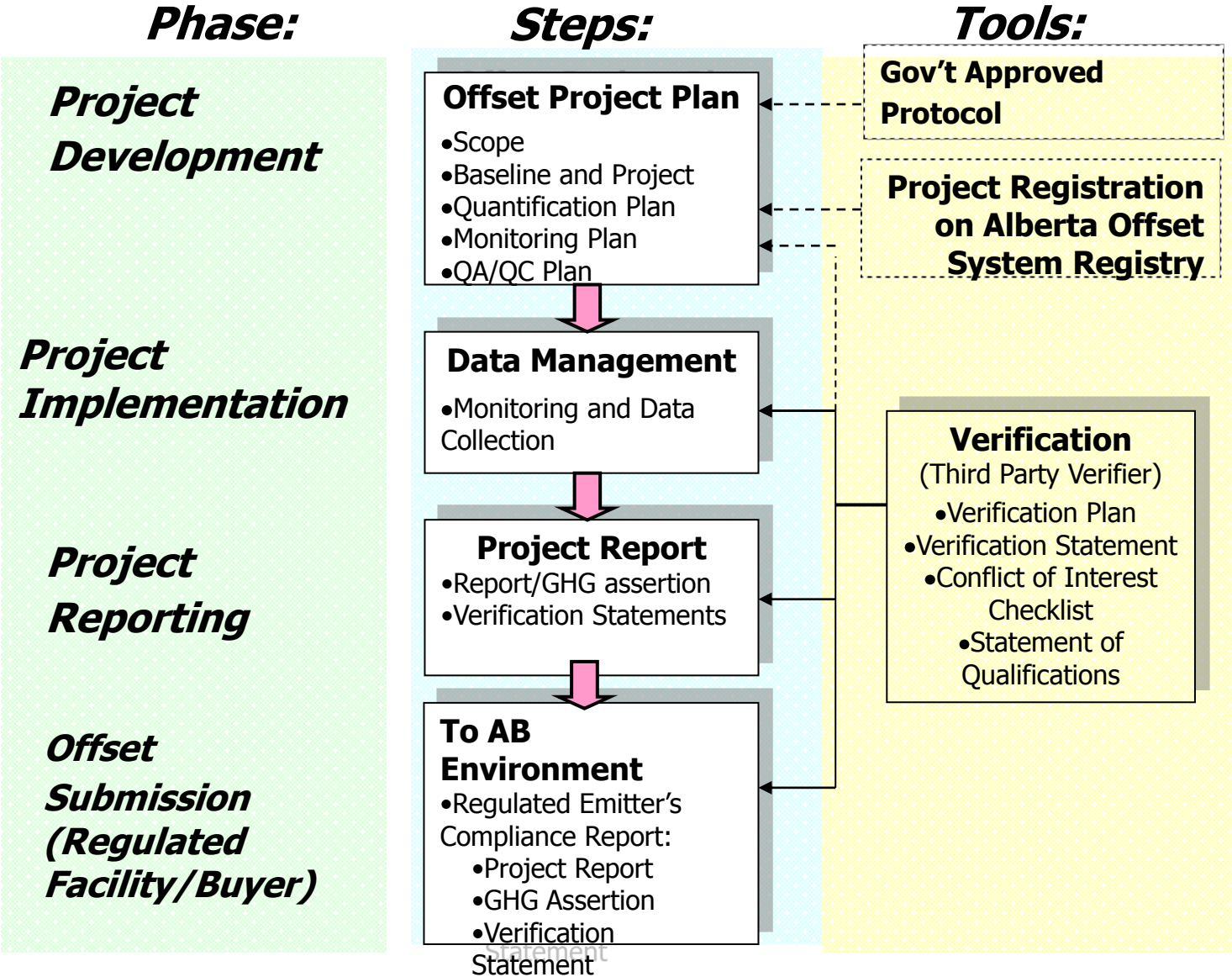
- Protocol Scope and Description
- Identification of Sources and Sinks
- Identification of Baselines
- Process Flow Diagrams of Project and Baseline Conditions
- Comparison of SS's
- Quantification of Reductions, Removals and Reversals of Relevant SS's
- Management of Data Quality
 - Record Keeping
 - QA/QC

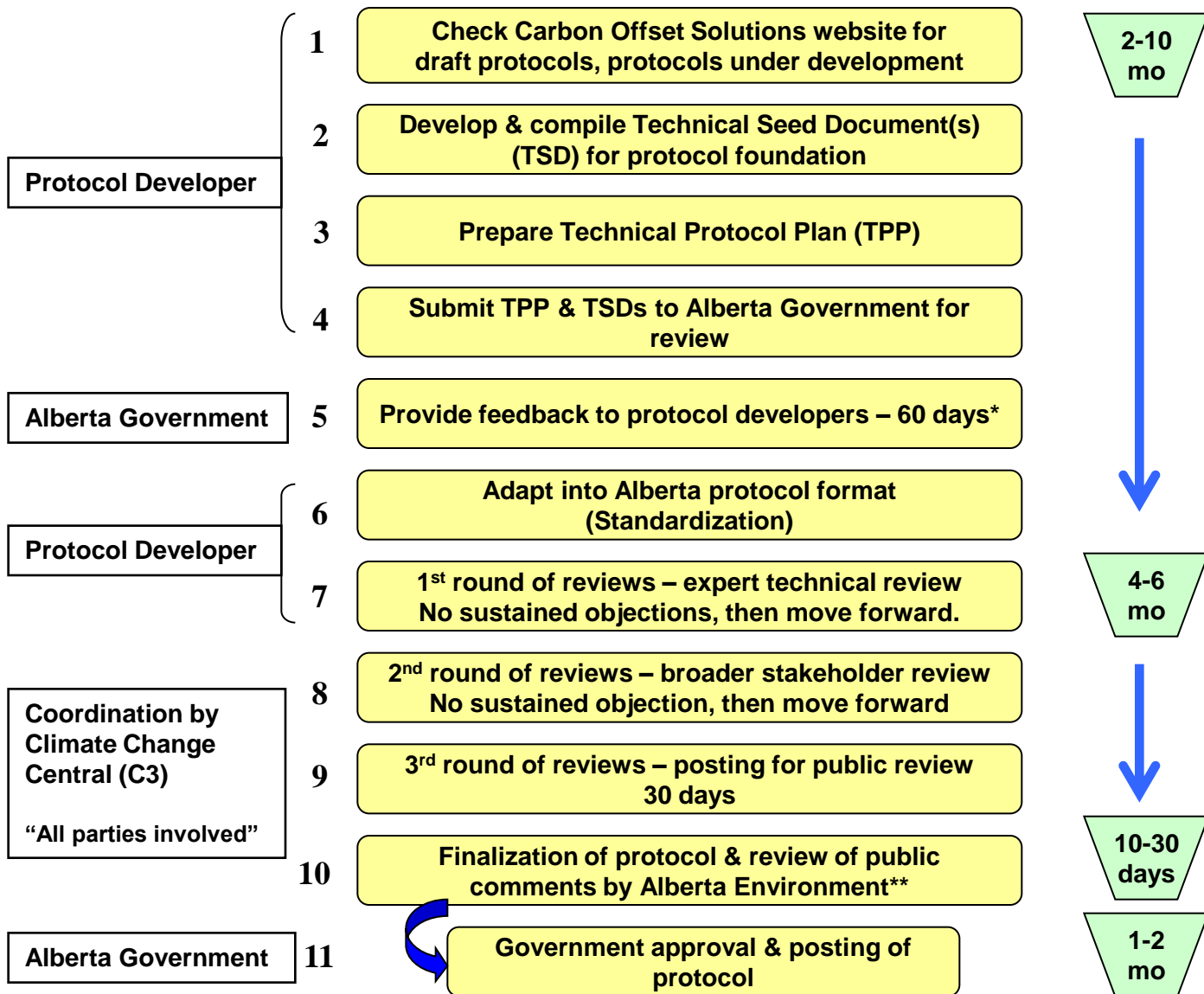


FIGURE 1.1: Process Flow Diagram for Project Condition



Creating an Offset Credit





Protocol Development Process

- There is currently no government approved protocol for your project type...what's next?
- **Review of any existing protocols:
- **Level 1 Protocol** = Developed from scratch, typically in an area where the science is developing
 - Significant input and review required
 - E.g. agricultural protocols
- **Level 2 Protocol** = Existing, but have limited technical review or are project-based
 - Based on a few scientific sources or a few projects
 - Will need broader review to test for applicability to wider situations
- **Level 3 Protocol** = Existing and based on credible, multi-scientific sources with wide applicability
 - Most advanced, well reviewed



•Step 1 – Check the Carbon Offset Solutions Website (www.carbonoffsetsolutions.ca)

Carbon Offset Solutions - Windows Internet Explorer

http://www.carbonoffsetsolutions.ca/offsetprotocols/protocolsreview.html

File Edit View Favorites Tools Help

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DRAFT ALBERTA PROTOCOLS

Closed Review

The following protocols have completed 3 rounds of technical stakeholder review as outlined in the Alberta Protocol Development process. They have been sent to Alberta Environment for consideration of final approval as an Alberta Offset System Quantification Protocol. The final review document and the complete listing of review materials is contained within each link.

- Wind-Powered Electrical Energy Generation (**Approved** see Approved Alberta Protocols Page)
- Solar (**Approved** see Approved Alberta Protocols Page)
- Beef - Edible Oils (**Approved** see Approved Alberta Protocols Page)
- Beef - Days on Feed (**Approved** see Approved Alberta Protocols Page)
- Road Rehabilitation (**Approved** see Approved Alberta Protocols Page)
- Landfill Bioreactor (**Approved** see Approved Alberta Protocols Page)
- Low-Impact, Water-Powered Electrical Energy Generation (**Approved** see Approved Alberta Protocols Page)
- Acid Gas Injection (**Approved** see Approved Alberta Protocols Page)
- Intermodal Switching (**Approved** see Approved Alberta Protocols Page)
- Green Building Projects - Residential (Small)
- Green Building Projects - Residential (Large)
- Green Building Projects - Commercial and Institutional

[Click here](#) to view presentations and records of discussion at the second round of reviews held January 24 and 25, 2008 on the above protocols given at the workshop.

POTENTIAL PROTOCOLS COMING FORWARD

- FlyAsh
- Gas Facility Insulation
- Engine Fuel Management and Vent Gas Capture
- Nitrous Oxide Abatement
- Wastewater Treatment
- Sludge Application
- Fugitive Emissions
- Energy Efficiency
- Compressor Station Retrofits

Internet 100%



Protocol Development Process

– Level 1

- **Step 2 – Information Gathering and Development of the Technical Seed Document(s)**

- **Phase 1 – Planning and Compilation Science Discussion Document**
 - Based on transparent, science-based standards and definitions, with scientific input and review from leading researchers and technical experts
- **Phase 2 – Science Coordination / Consultation**
 - Discussion paper is the primary vehicle for coordinating science, fostering discussion and building consensus on key protocol factors
 - Pose numerous questions throughout the Science Discussion paper related to protocol elements (baselines, practices, coefficients, calculation methodologies, etc) = **Consensus Building Workshop / Science Coordination Workshop...**
- *Phase 3 – Development of a Technical Seed Document*
- *Phase 4 – Standardize into Alberta Protocol Template*

May take up to 12 months

- *Then proceeds into the Alberta Protocol Review Process*



Protocol Development Process

- **Phase 3 – Development of a Technical Seed Document**
 - The Technical Seed Document should follow the general requirements of GHG projects outlined by the International Organization for Standardization (ISO/DIS 14064-2) and Offset System specifications.
 - Complete the Technical Protocol Plan for submission to government
- **Phase 4 – Standardize into Alberta Protocol Template**
 - **Development TSD may take up to 12 months**
 - **Then proceeds to the Alberta Protocol Review Process**



Government Technical Review

- **Step 3 – Prepare the Technical Protocol Plan**
 - The Protocol Developer must complete the Technical Protocol Plan (Appendix A) in order to initiate the protocol development process. The form is divided into two sections:
 - Part A - Identification of the Protocol Developer(s)
 - Part B - Description of the proposed Quantification Protocol
- **Step 4 – Submit the Technical Protocol Plan (TPP) and Technical Seed Document(s) (TSD) to Government of Alberta for Review**
- **Step 5 – Review and Feedback of the Technical Protocol Plan**
- **Step 6 – Adapt the TSD into the Standardized Alberta Protocol Format**



Rigorous Technical Review

- **Step 7 – First Round of Review - Expert Technical Review**

The Technical Review process must adhere to following four principles:

1. Environmental Integrity – Considering all GHG sources controlled, affected and related to the Project;
2. Usability - Reasonableness (to balance the environmental integrity) – using consistent approaches to decide what needs to be quantified in baseline and project
3. Adapting precedent set elsewhere – Borrowing from tools, methodologies and approaches used in other Systems; and
4. Life cycle or partial life cycle analysis approach – As outlined by the ISO 14064-2 framework.

- **Step 8 – Second Round Broader Stakeholder Review**

- Same ISO 14064-2 Principles follow review
- Climate Change Central, on behalf of Alberta Environment, coordinates a structured consultation process bringing together a diverse group of stakeholders involved in the carbon value chain to review the protocols



Step 9 – Third Round of Reviews - Posting of Revised Protocols for Public Review

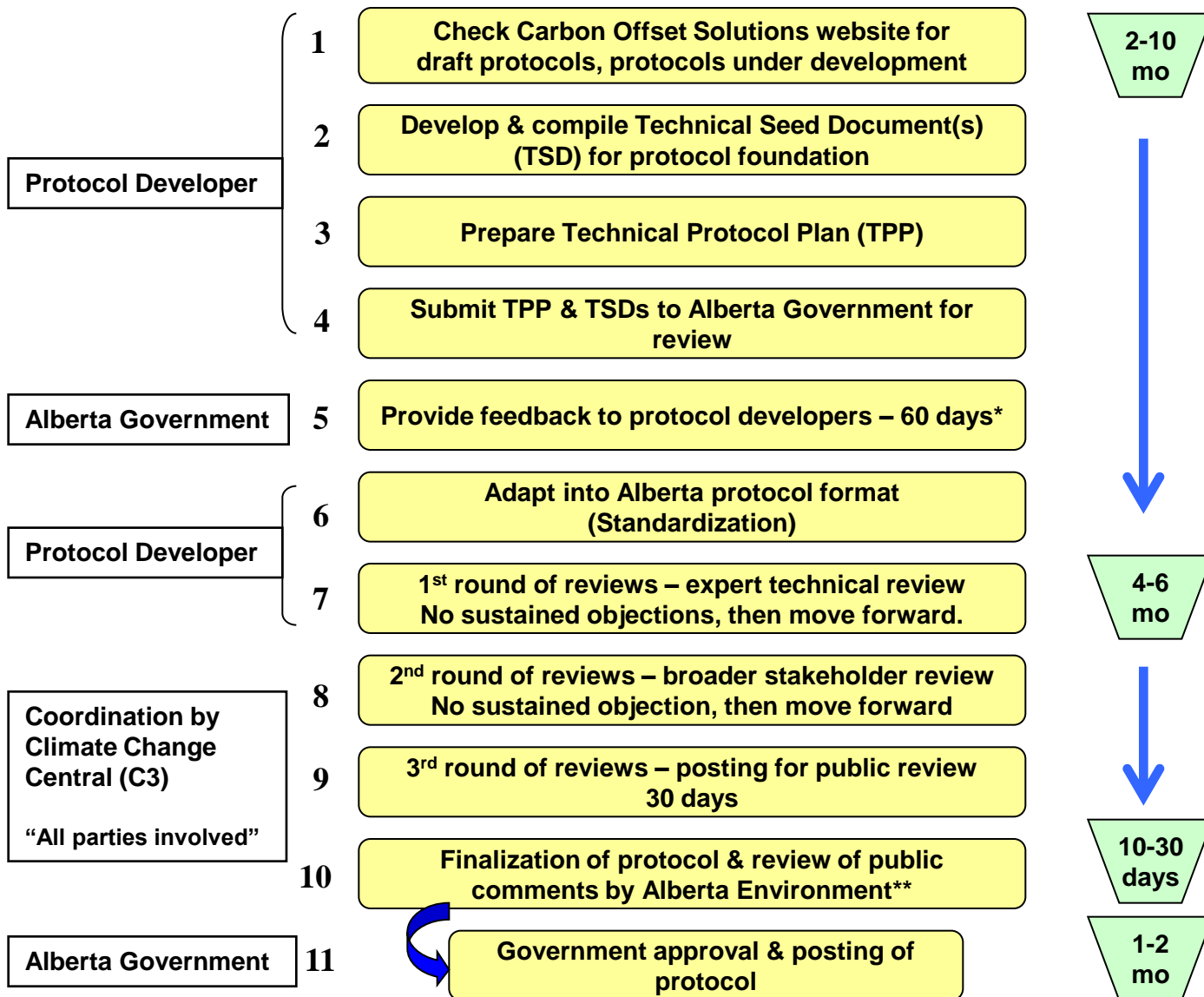
Climate Change Central, on behalf of Alberta Environment, will then post the Protocol and documentation on www.carbonoffsetsolutions.ca for 30 days in a public review and commenting period.

Step 9a – Dispute Resolution

In the event that significant issues are raised, or that there are unresolved issues associated with the proposed protocol, Alberta Environment will work with the Project Developer and review team to take appropriate action to address issues and reach consensus. The protocol must achieve no sustained objection to be presented for final approval.

Climate Change Central will post records of discussions and changes on the www.carbonoffsetsolutions.ca website to ensure ongoing transparency.





- A protocol forms the foundation of an offset
- Without a robust and scientifically valid protocol, an offset is worthless
- What do we want to see in a protocol?
 - Expert engagement
 - Defensible methodologies
 - Rigorous peer review
 - Transparency



- Protocol Methodology, Scope and Description
 - Project scope
 - Applicability
 - Quantification approach
 - Flexibility provisions
 - Glossary of terms
 - Definition of functional equivalence
 - Identification of all Sources and Sinks for the project
 - Identification of controlled, related and affected SS.



- **Baseline Condition**
 - Identification of baseline approach
 - Identification of all sources and sinks for baseline
- **Selection of Relevant SS's and requirements for quantification**
 - Identification of relevant SS's for quantification
 - Identification of SS's for monitoring
- **Quantification of Identified Sources and Sinks**
 - Identification of quantification methodologies for emissions and removals
 - Data management procedures\appendicies – emission factors, coefficients, etc



Tools and Guidance

- Alberta Protocol Development Guide
 - Alberta Technical Protocol Plan
- ISO 14064-2 Standard
- International Good Practice Guidance (e.g. IPCC, World Bank, UN Climate Change Mechanisms – CDM)
- National – Canada's GHG Inventory Methodologies (Tier 11 and 111)



Alberta Approved Quantification Protocols

APPROVED

PENDING APPROVAL

- **GHG Emission Removal Projects = Carbon Sinks** (remove GHGs from atmosphere)
 - **No-Tillage Management**
 - **Afforestation** (PENDING - Planting Trees)
- **GHG Emission Reduction Projects**
 - **Pork** (Feeding/Manure Storage & Spreading)
 - **Biogas** (Anaerobic Decomp. Ag Materials)
 - **Beef Feeding of Edible Oils**
*Updated
 - **Beef Reducing Days On Feed**
*New
 - **Beef Lifecycle** (Reducing age at slaughter)
 - **Biofuels**
 - **Energy Efficiency** (pork, dairy, poultry facility process changes/retrofit)
 - **Dairy**

- **GHG Emission Removal Projects**
 - **Reducing Summerfallow Practices**
- **GHG Emission Reduction Projects**
 - **Selection for Residual Feed Intake in Beef Cattle**
 - **Nitrous Oxide Emission Reduction** (On-farm management)
 - **Mechanical Pulp Sludge Application on Agricultural Lands**



Alberta Approved Quantification Protocols

GHG Emission Reductions Cont...

- **ENERGY EFFICIENCY**
 - Waste Heat Recovery
 - Waste Heat Recovery (Streamlined)
- **GEOLOGICAL SEQUESTRATION**
 - Acid Gas Injection
 - Enhanced Oil Recovery
 - Enhanced Oil Recovery (Streamlined)
- **METHANE MANAGEMENT**
 - Aerobic Composting (Non-ag material)
 - Landfill Bioreactor
 - Landfill Gas Capture
- **TRANSPORTATION**
 - Modal Freight Shift
 - Road Rehabilitation
- **RENEWABLE ENERGY**
 - Biofuels (Production)
 - Biomass (Production)
 - Solar Electricity Systems
 - Wind-Powered Electricity Systems
 - Run-of-the-River Electricity
- **WASTE MANAGEMENT**
 - Non-Incineration of Thermal Waste
 - Anaerobic Wastewater Treatment
- **OTHER**
 - Engine Fuel Management and Vent Gas Capture
 - Instrument Gas Conversion to Instrument Air
 - Nitrous Oxide Abatement from Nitric Acid Production
 - Sulphur Extender in Asphalt Production and Use



Potential Alberta Quantification Protocols

MORE POTENTIAL PROTOCOLS COMING FORWARD

- ENERGY EFFICIENCY IN COMMERCIAL AND INSTITUTIONAL BUILDING
- REDUCTION OF METHANE EMISSIONS FROM OIL AND GAS FACILITIES
- PUMP SYSTEM CONVERSION PROJECTS
- SOLUTION GAS CONSERVATION PROJECTS
- FLY ASH USE IN CONCRETE AND OTHER CEMENT BASED PRODUCTS

OTHER PROTOCOL AREAS UNDER CONSIDERATION

- Wetlands Management
- Conversion to Perennial Forages
- Lagoon Cover
- Pasture Management



Where to go for more information?

- Guides exist to help along the way
 - NEW Draft Offset Project Technical Guidance v2.0
December 2009 (under review)
 - Alberta Offsets Guidance Document
 - Alberta Verification Guidance Document
 - Guide to Protocol Development (by request)
- www.carbonoffsetsolutions.ca website
- Give me a call!



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