

Pacific Carbon Trust Monetizing the Value of Vented Methane

April 11, 2012



Agenda

- British Columbia Policy and Pacific Carbon Trust Overview
- Pacific Carbon Trust Projects in the Gas Sector
- Offset Project overview

BC has a strong price signal on carbon

Standards (Regulations)

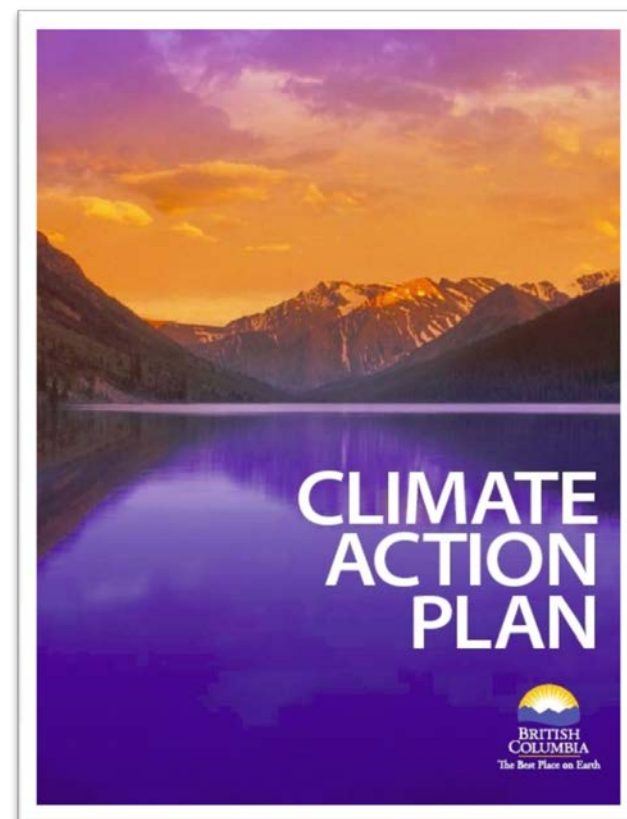
Greenhouse Gas Reduction Act
Vehicle Emissions Standards
Regulate Landfill Gas

Investments (Programs)

LiveSmart
Innovative Clean Energy (ICE) Fund
Pacific Institute for Climate Solutions

Price on Carbon (Fiscal/Market)

Carbon Tax Act
Cap and Trade (WCI)
Pacific Carbon Trust (PCT)



PCT is a Crown Corporation with the mandate to help BC meet its Climate Action goals

PCT's mandate

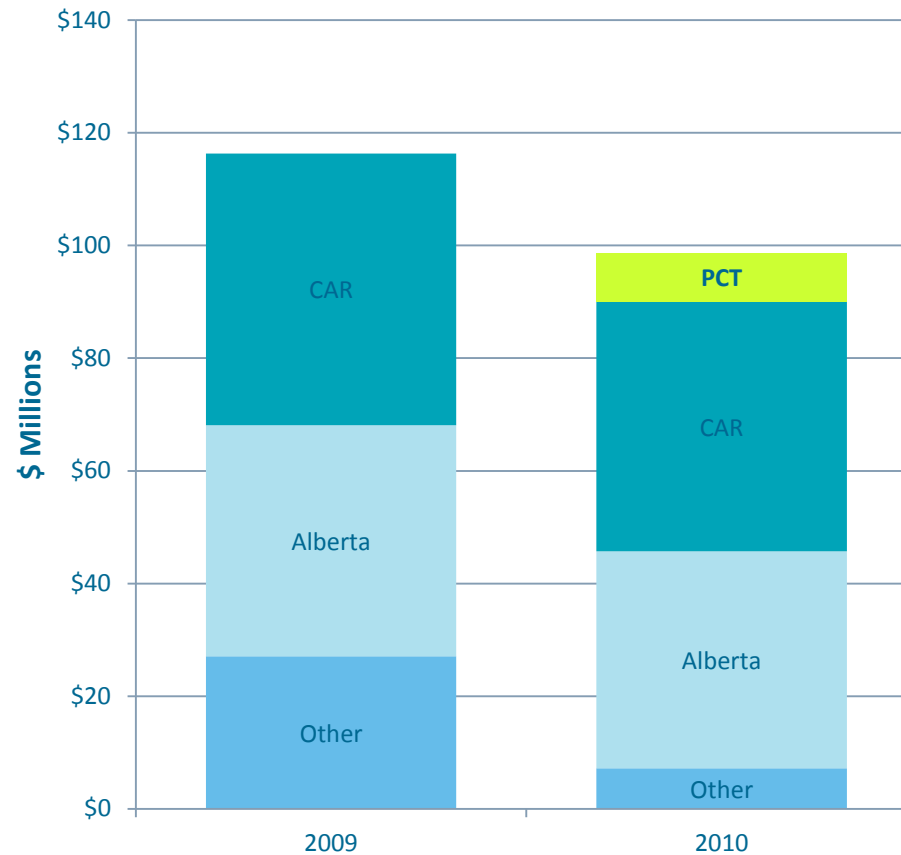
Deliver quality, BC based emission reduction projects to help clients meet their CO₂ reduction goals

AND

Support the growth of BC's low carbon economy

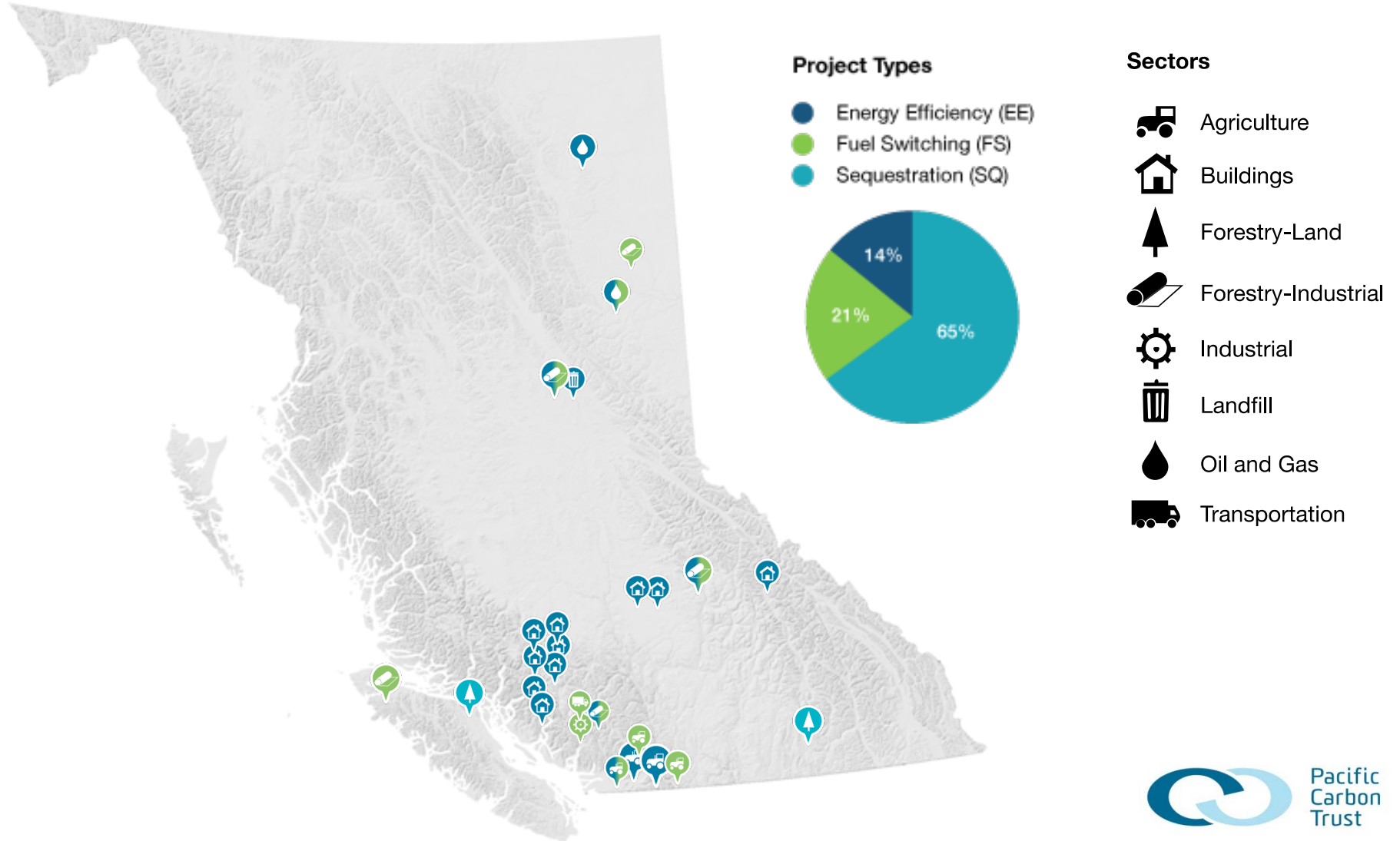
- BC Crown corporation = strong, creditworthy counterparty
- Mandated (by legislation) supplier of offsets to BC Government = demand of >700,000 tonnes annually
 - Completed first delivery June 2011
- Able to put a premium price on carbon reductions
- Actively pursuing carbon offset opportunities across BC's economy with a strong focus on oil & gas projects

PCT is a new and significant player in the North American carbon market



Source: Point Carbon, Thomson Reuters.

PCT portfolio distribution 2011 – 730,000 Tonnes



Pacific Carbon Trust has carbon projects with many companies in the gas sector



- Emission reductions arising from innovative drilling practices



- Emission reductions arising from electrification of compressors and low emission wellsites



- Emission reductions arising from electrification of gas plant and zero emissions wellsites



- Emission reductions arising from electrification of main drives at gas plant



- Emission reductions arising from pumpdown and incineration of transmission pipeline blowdowns

Case Study: gathering and production project

TYPE: Energy Efficiency / Fuel Switching

LOCATION: British Columbia

ESTIMATED PROJECT VOLUME: 50,000 tCO₂e/yr

PROJECT START: 2010

PROTOCOLS USED:

Instrument Air

Pump Conversion

Fuel Switching

KEY ISSUES:

- **Data on chemical volumes injected**
- **Need for metering of instrument air**
- **Transmission line costs**



Case Study: midstream project



Spectra Energy Reduction Of Methane Venting From A Gas Transmission Pipeline System

TYPE: Venting Reduction

LOCATION: Various locations on Spectra Energy's system in
British Columbia

PROJECT VOLUME Purchased: **Approx. 41,000 tCO₂e**

PROJECT START: **2008**

Four Pumpdown / Incineration events from 2008 to 2010

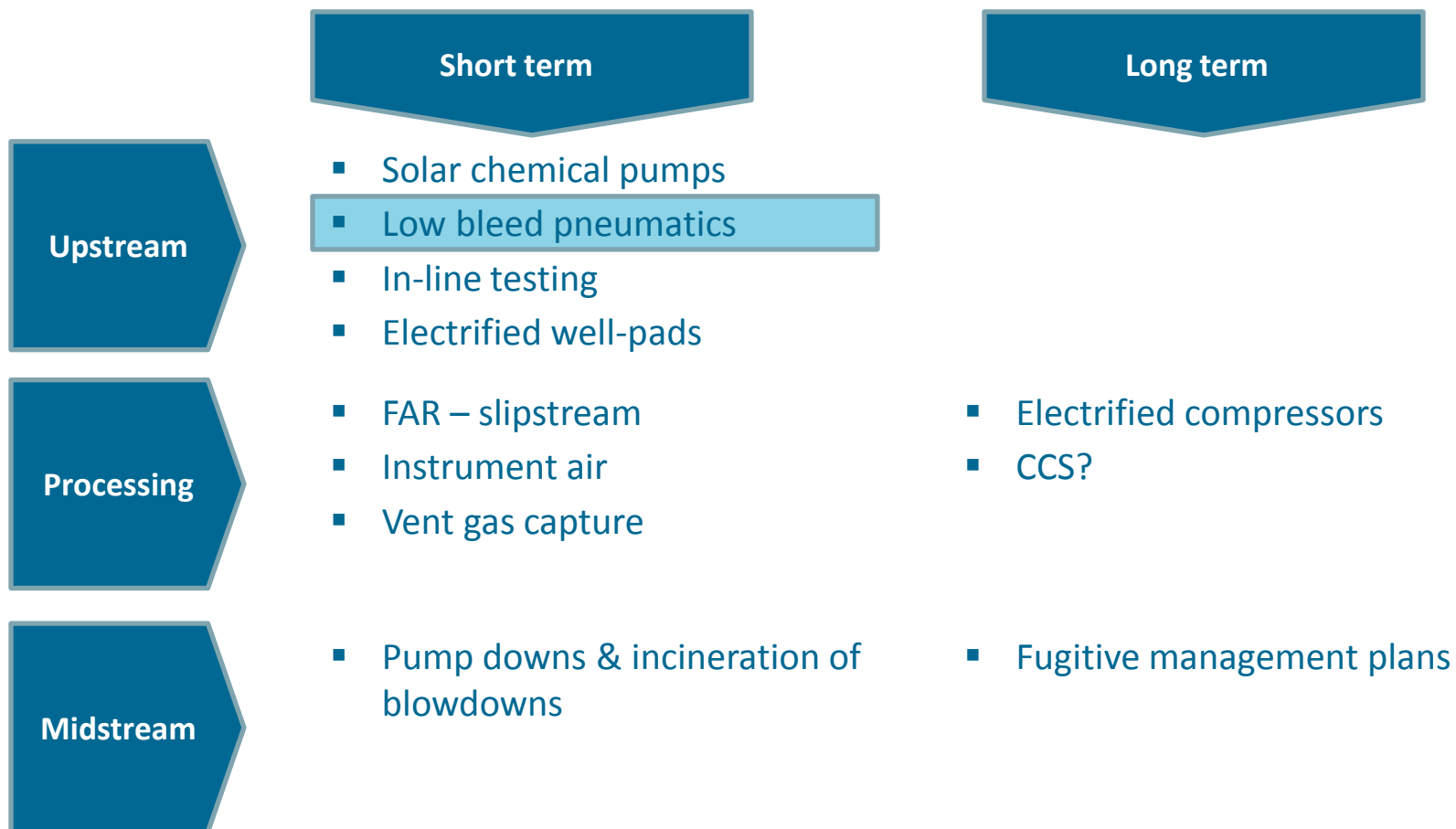
PROTOCOL:

Blowdown Protocol for Pipeline Systems

KEY ISSUES:

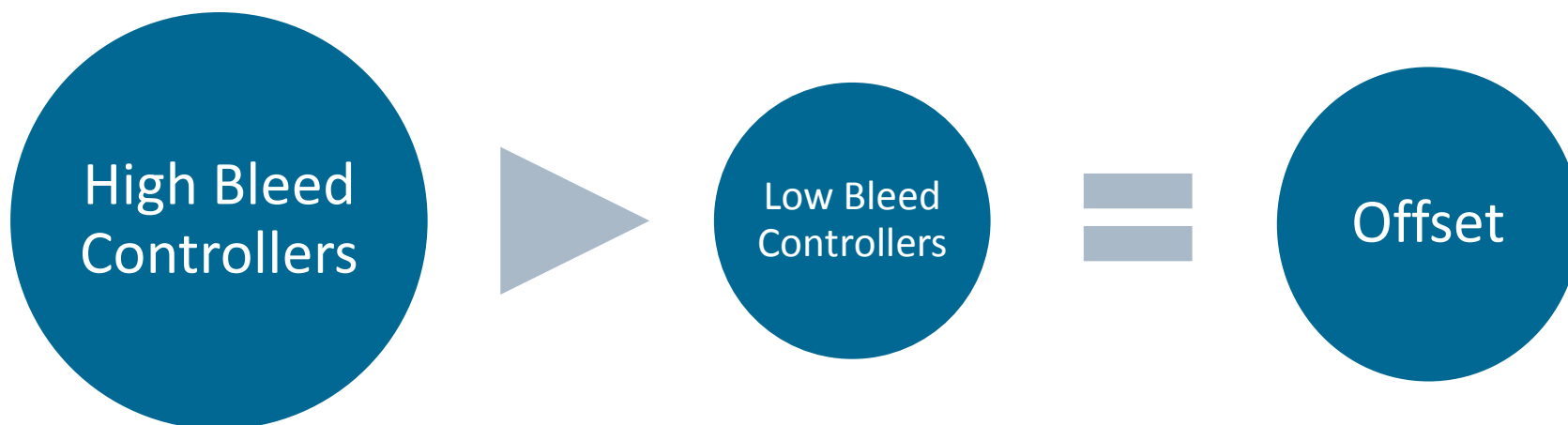
- Increased compressor fuel on other parts of system
- Increased outage time related to pumpdown / Incineration.
- Multiple methods of blowdown mitigation

PCT is focused on specific technologies to drive GHG emissions reduction projects in the gas sector



High to Low Bleed Offset Projects

- Pneumatic controllers are used to operate Oil & Gas well sites when electricity is unavailable
- Controllers works by taking pressurized gas from the well site (fuel gas) and using it for motive and operational force - spent fuel gas is then vented to atmosphere
- Offsets can be generated by switching from high bleed (greater than 6 scf/h) to low bleed controllers (less than 6 scf/h)
- Protocol relies on statistical sampling of existing controllers by make and model
- Offset revenue @ \$10/Tonne moves a project from negative -23% IRR to + 27% IRR based on current natural gas prices



Potential opportunity for high to low bleed pneumatic conversions for California market

Opportunity

- ACR Protocol being considered as a pre-compliance protocol for California cap and trade market
- Currently only 3 projects listed on ACR – demand could outstrip supply

Economics

- Payback within two years based on current gas prices and carbon @ \$10/tonne

Timing

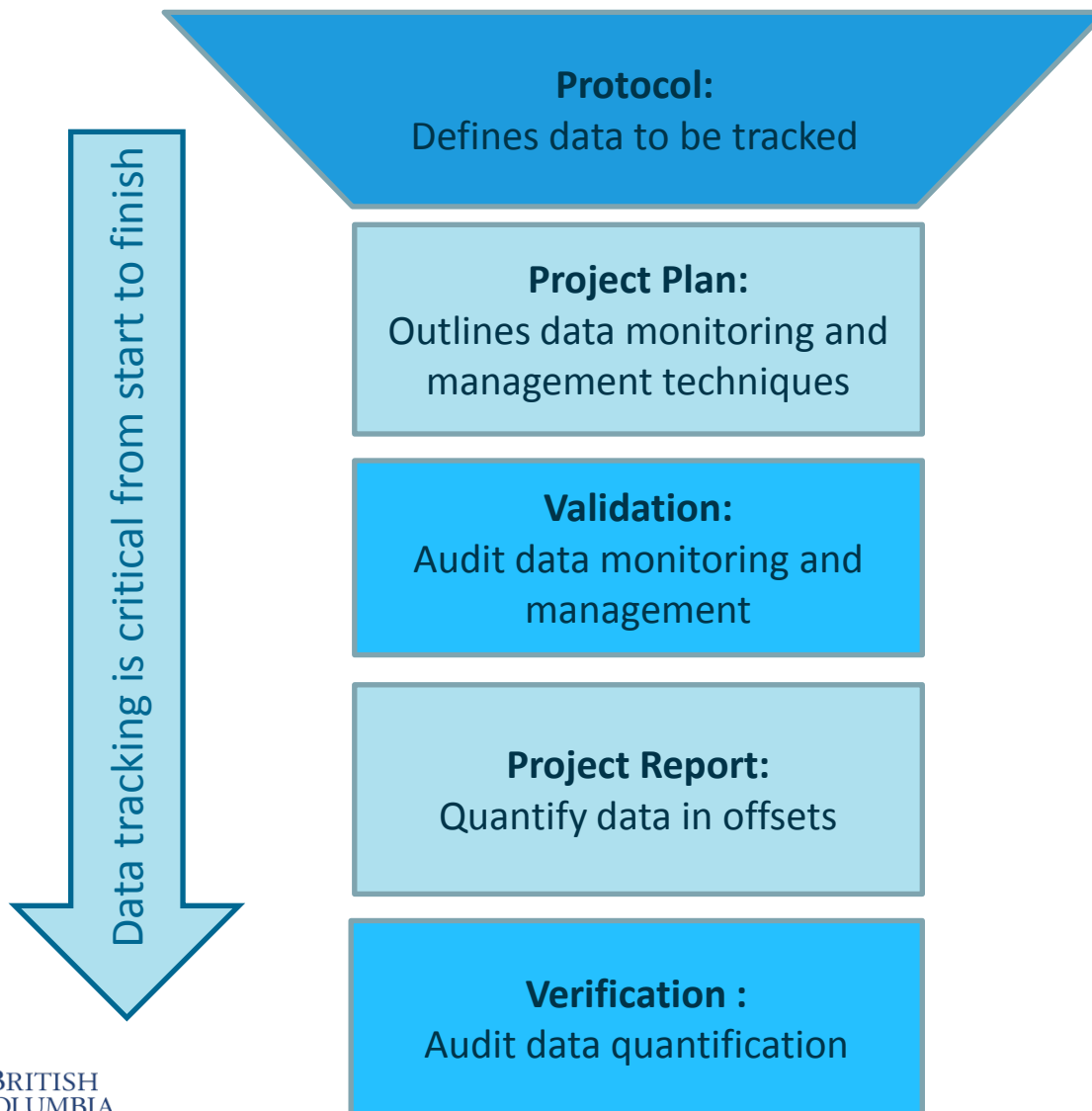
- Time bound opportunity as sector will be capped in 2015

PCT has adapted the protocol for use in British Columbia and is working with gas companies on conversion projects

Offset Project Journey



Offset generation is a data driven process



Pacific Carbon Trust Summary

- From startup to one of the largest carbon players in North America in under three years
- Management of offset projects through to delivery
- Expertise on methane reduction projects in the gas sector
- Experience with almost all offset project types
- Interested in pursuing further opportunities in the sector



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