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GAS RECOVERY
Optical Fugitive Emission Pilot Study

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Overview

- Background
- Pilot Study Scope
- Summary of Findings
  - Source Data
  - Facility Comparison
  - Economics
- Path Forward

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Fugitive Emissions

Losses (leaks) of HC product
(methane, propane, VOC's)

UNINTENTIONAL FUGITIVES

- normal wear and tear / damage
- improper or incomplete assembly of components
- inadequate material specification
- manufacturing defects

INTENTIONAL FUGITIVES

- venting (tanks, controllers, comp. seals, stacks, etc.)

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“Why worry about some little leaks?”

“What is the Problem?”
Gas leaks are *invisible*, *unregulated* and *go unnoticed*

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Background

Study Objective

- evaluate new leak detection and measurement technology and determine actual facility fugitive emission rates

Drivers

- Increase production & reduce costs by recovering lost gas
- CAPP Fugitive Emission Management BMP
- Increase operations Health & Safety
- Reduce GHG emissions / Carbon Credits
- Part of CPC E/E, Gas Star Program, and BIC Initiative

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Background

Detection Technology

- **GasfindIR - optical emission technology**
  - infrared video camera with hydrocarbon/VOC filter
  - provides visible images of a HC gas emissions in real-time

Benefits :

- Rapid, accurate and safe detection
- Scan hard-to-reach components from a distance
- Assessments performed without interruption of operations
- Inspection times are minimal, which can keep costs down.
- With exact leak source info, repairs are less time consuming and less expensive.
- Cost-effectively scan hundreds of components simultaneously

Approx. Cost:

$75,000.00USD

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Background

Measurement Technology

- **HiFlow Sampler – volumetric leak measurement**
  - vacuum flow rate detection uses dual-element hydrocarbon (methane) detector
  - measures hydrocarbon concentrations in the captured air stream and determines the leak flow rate (+- 10%)

Benefits :

- offers a much higher accuracy of measurement (compared to conventional methods)
- allows an objective cost-benefit analysis of each repair opportunity

Approx. Cost:

$14,000 USD

SCOPE

- Evaluate 22 facilities (9 gas plants and 13 comp. stns.) from various asset areas
- Obtain fugitive emission data
- Complete repair cost/benefit analysis
- Create recommendations for applying a Canada-wide program (CAPP BMP)

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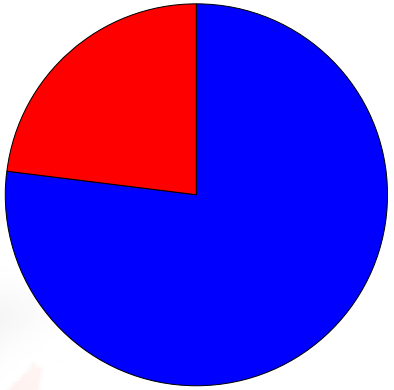
SOURCE INFO

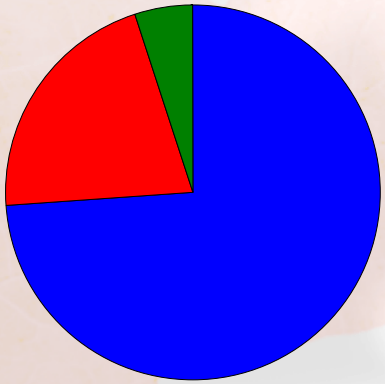
of Sources

- **77%** leaking components (111)
- **23%** other fugitive emission sources (33)
- **92%** economical to repair (133)



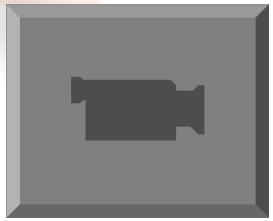
Composition

- **75%** Process gas (108)
- **21%** Fuel gas (30)
- **4%** Propane (6)



Location

- 72% Compressor Buildings
- 20% Process Buildings
- 4% Outside piping
- 4% Tanks



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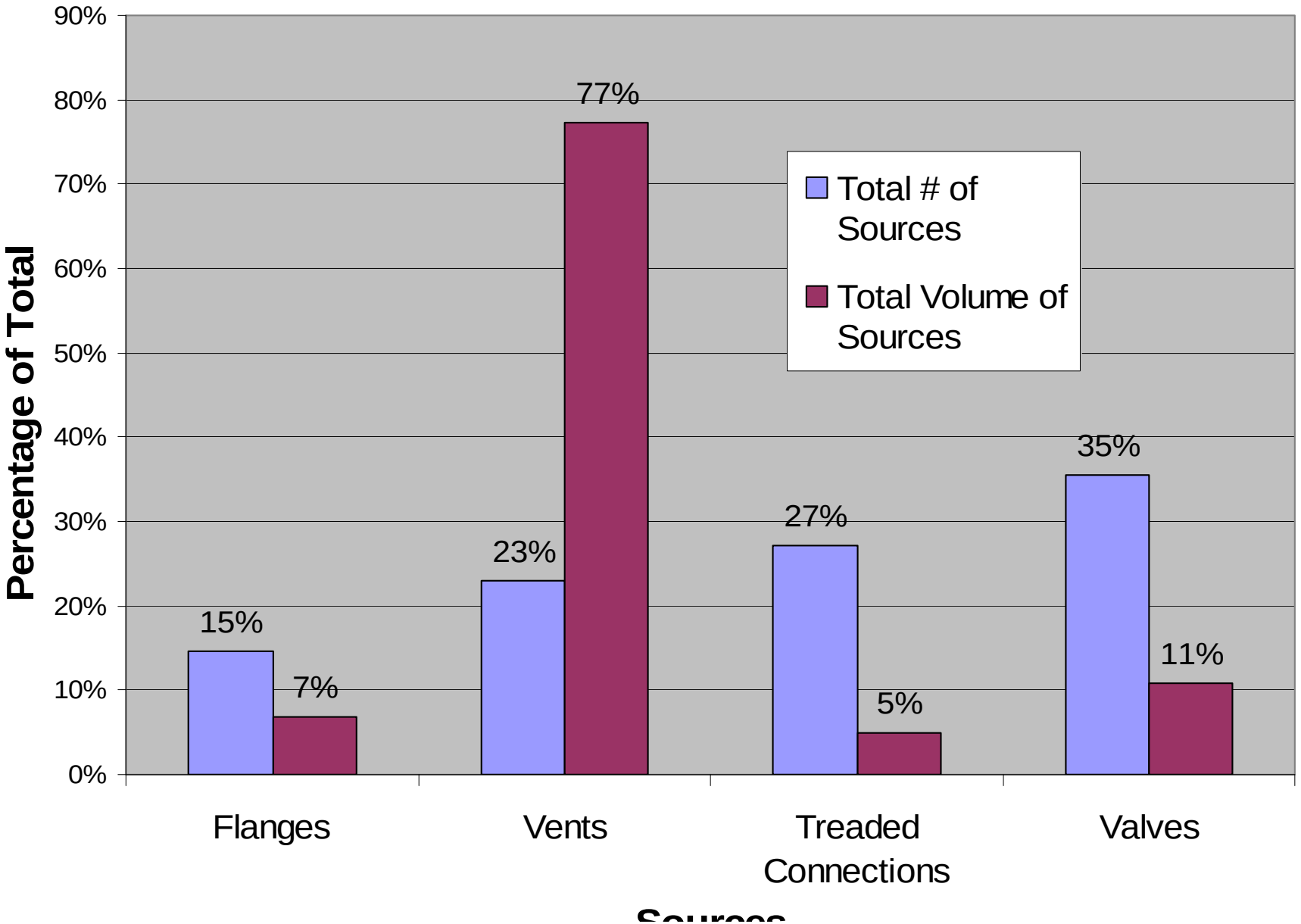
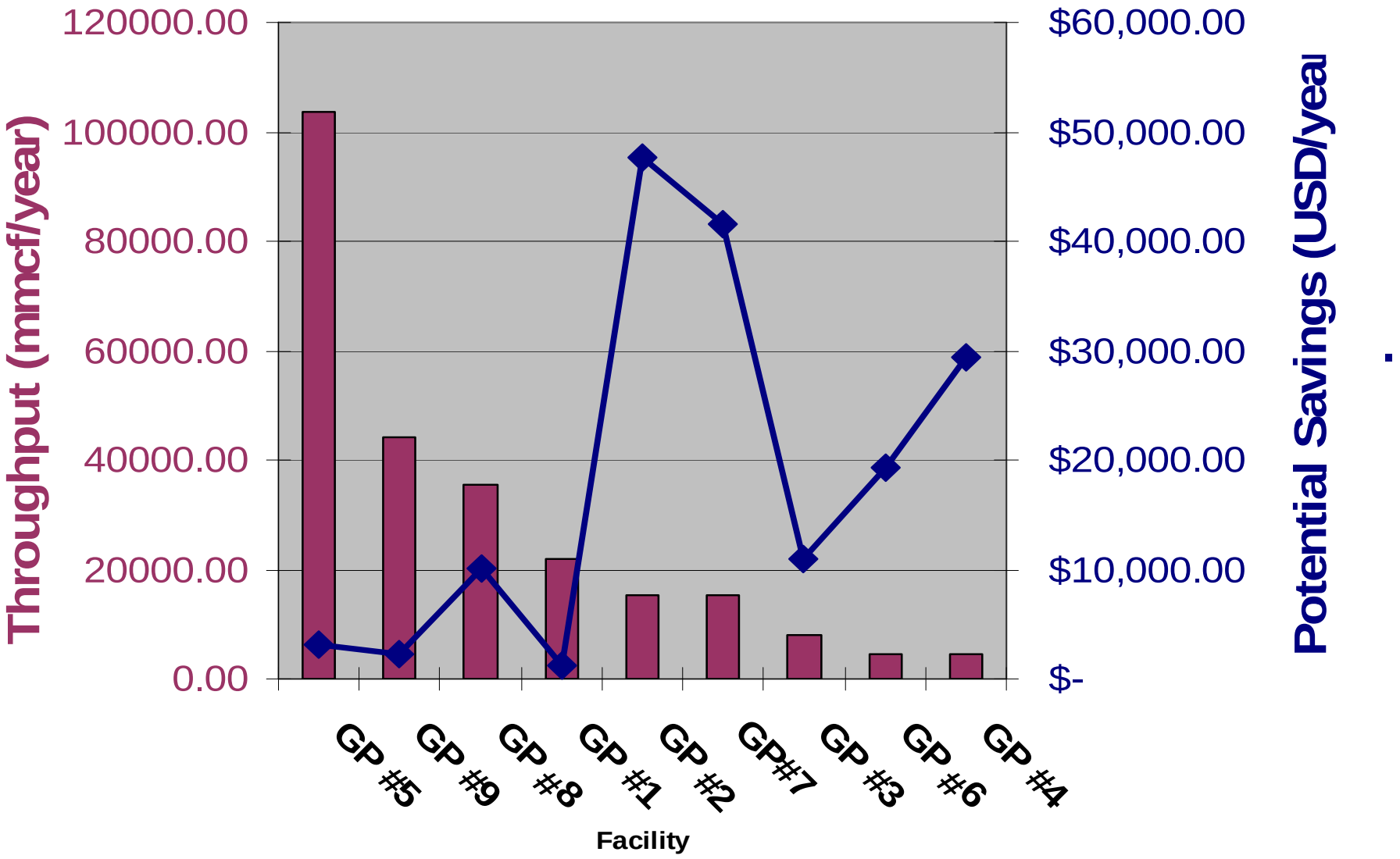
SOURCE TYPES



GAS PLANT COMPARISON



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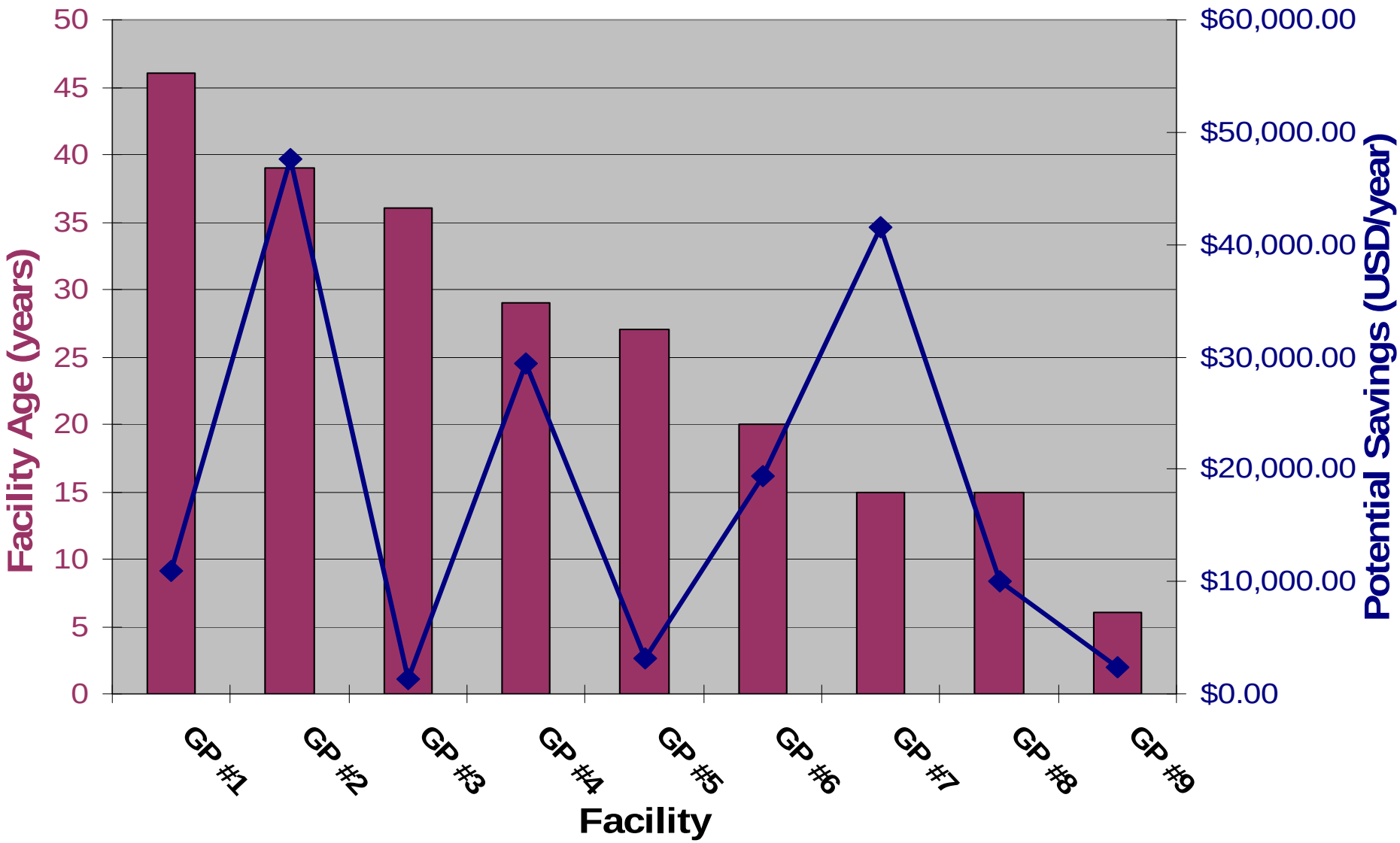

ECONOMICS

Average Yearly Savings/Facility (US$/year)	**$16,300.00**
Average Total Cost/Facility (US$/year) **(assessment and repairs)**	**$8,000.00**
Average Est. Payout Period (years)	**0.50**
Total Gross Est. Annual Savings (US$/year)	**$10,400,000.00**
Total Est. NPV (US$/year)	**$35,000,000.00**
CO2e/year Reduction (tonnes)	**630,000**
CO_2e Credit Value (US$)	**$15,750,000.00**

* Using $5.50 USD/mmbtu and $25.00 USD/tonne CO2e

CAPP BMP CONTROL STRATEGY

- **Fugitive Assessment Schedule**
  - Company-wide assessment of all facilities
- **Fugitive Maintenance Plan**
  - Operating procedures and performance objectives for minimizing fugitive emissions
  - Directed Inspection & Maintenance (DI&M) Program
    - Prioritize inspections to target high potential processes and components
  - Influence facility design (i.e. flow meters, low bleed, vapour recovery, etc.)

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Table 1. Proposed schedule for implementation of this fugitive

Type				
Gas P				
				two
Comp Statio				
				two
Group Batte Single Batteries	Vapour Control			

Initial 4-year Schedule

- ~150 Facilities/ year
  - Majority of GP in 1st year
- ~ 70 assessment days/year
- Coordinate with turn-arounds when possible

After 4 years

- 2 year maintenance-phase schedule
- Average assessment times drop due to leak rates decline
- Leak-prone facilities will require a higher priority/rate of assessment
- Operators request assessments based on fugitive maintenance findings

PATH FORWARD

- **Set schedule to follow CAPP BMP guideline**
- **Evaluate pipeline opportunities**
- **Decide on resources**
  - i.e. third party, in-house, cost/benefit evaluation
- **Develop Fugitive Maintenance Plan**
  - Imbed Fugitive Management into Operations and Facility Design
- **Education / Knowledge Sharing**

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QUESTIONS?

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