



CETAC WEST



# Energy Audits

Methane to Markets-Oil and  
Natural Gas Technolo  
Transfer Workshop

Jamie Swallow, P.Eng.

**Sulphur** eXperts

**amine** eXperts

**Sulphur** eXperts

**amine** eXperts



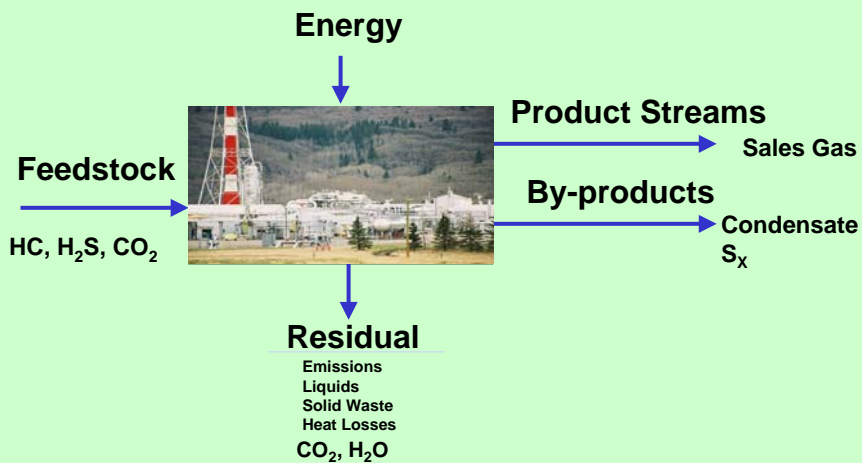
CETAC WEST

- Eco Efficiency
- Energy Efficiency + Environmental Efficiency

# Eco-Efficiency as applied to The Canadian Upstream Oil and Gas Sector



## Integrated Plant Audit



## Integrated Plant Audit = Process Diagnostics

"A **concurrent** examination  
by a  
**multidisciplinary** team  
of  
**leading industry experts**  
to seek out economic and  
environmental improvements."

$$2 + 2 > 4$$

## Potential **Fuel Gas (Methane)** and Electrical Savings

- 16 Plant Summary Normalized to CAD 5.25/GJ and CAD 60/MW

	Current Consumption (CAD)	Potential Savings (CAD)	%
<b>Fuel Gas</b>	<b>90 000 000</b>	<b>11 700 000</b>	<b>13</b>
Electricity	33 000 000	3 000 000	9
<b>Total</b>	<b>123 000 000</b>	<b>14 700 000</b>	<b>12</b>

## Annual Gas Processing 2005 - Canada vs. Mexico

	Raw Gas Production (10 <sup>3</sup> m <sup>3</sup> )	Potential Savings (10 <sup>3</sup> m <sup>3</sup> )	%
Canada	180 000 000	23 400 000	13
Mexico	60 000 000	8 000 000	13+

## Canada Greenhouse Gas Reductions -GHG (CO<sub>2</sub>E) (16 Plant Summary)

...as a **by-product** of energy conservation

Current Emissions tonnes/year	Potential Reductions tonnes/year	%
1 300 000	240 000	~19

Reductions ranged from 10% to 35% at the 16 Plants,  
including fugitive emissions

## Eco-Efficient Technology Implementation

- market ready
- proven reduction in energy consumption or emissions
- technologies appropriate to identified opportunities

## Eco-Efficient Technology Demonstration in Industry

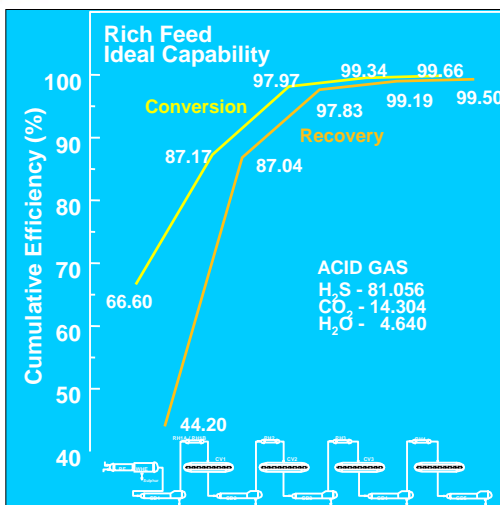
- sulphur plant thermal incinerator optimisation
- process optimisation tools
  - amine treating
  - sulphur recovery
  - dehydration
- pneumatic equipment emissions reduction
- natural gas engine controls
- zero emission compressor/pump

# Sulphur Plant Incinerator Optimisation

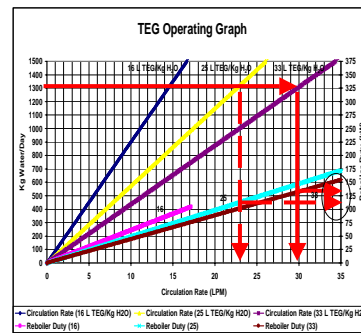
**Stack top temperature reduction**



# Process Optimisation Tools

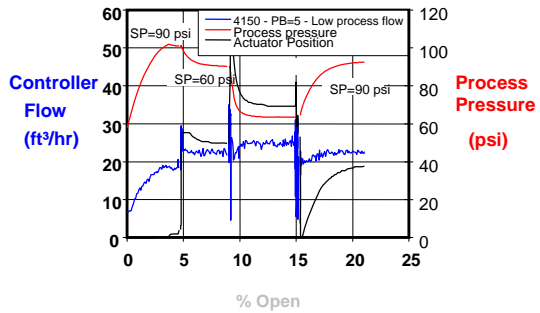


**Tools for optimal operation**



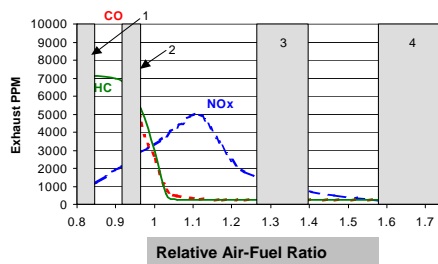
# Pneumatic Equipment Emissions Reduction

Reduce emissions from constant bleed instrumentation



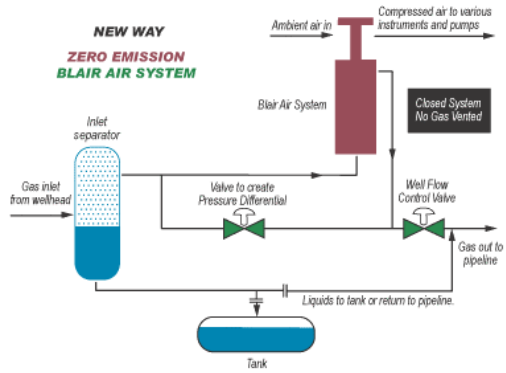
# Natural Gas Engine Controls

Rich to lean conversion



# Zero Emissions Compressor/Pump

All gas returns back to the pipeline to be sold



Thank You

Questions?