



2016 British Columbia Greenhouse Gas Emissions



November 21, 2017

CANADIAN ENERGY. GLOBAL REACH.

Presentation



- Who is Progress Energy?
- Overview of emissions categories
- Fugitive emissions program management
- Findings and opportunities
- Summary

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The Montney Formation



Progress is the largest natural gas reserves owner in Canada

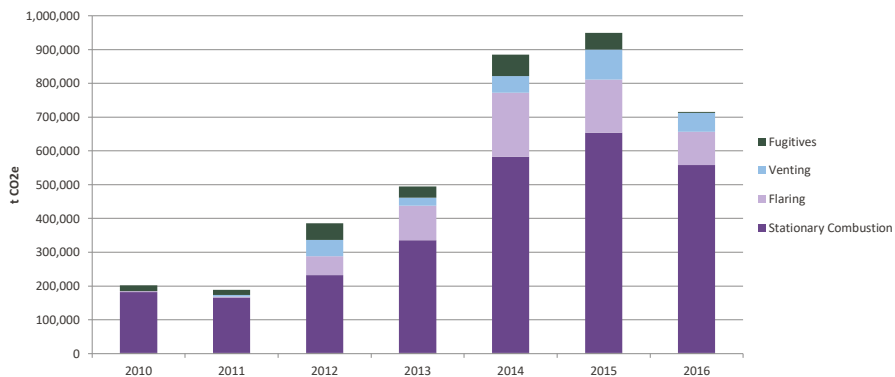
- There is an annual requirement to report greenhouse gas (GHG) emissions from our BC operations
- Proposed Federal methane regulations cover areas that Progress reports emissions on in detail each year
 - Fugitive emissions
 - Pneumatic devices
 - Venting
 - Compressor packing venting
- The verified aggregate emissions for BC in 2016 were 712,872 t CO₂e

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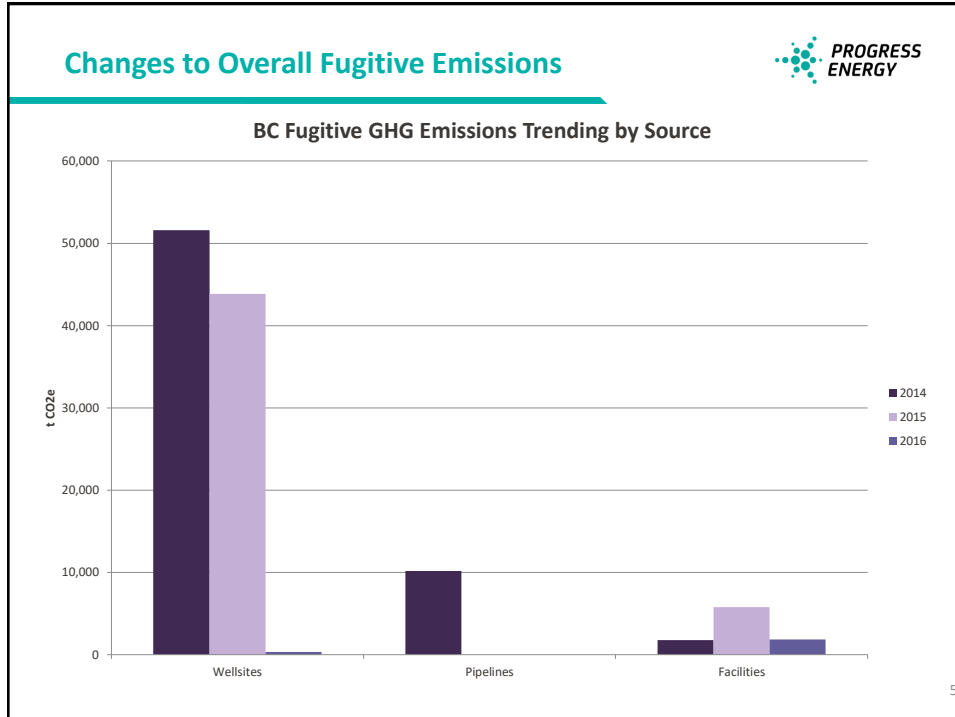
GHG Emissions Sources




BC GHG Emissions Sources Profile



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Fugitive Emissions Management Program



- Progress has a Fugitive Emissions Management Program (FEMP) in place for the following reasons:
 - Safety
 - GHG management and reporting
 - Gas conservation
 - Company reputation
 - Regulatory compliance
 - Flaring and Venting Reduction Guideline in British Columbia –DPR 41(5)
 - CAPP Best Management Practice for Fugitive Emissions Management (2007)
 - CSA Standard Z620
 - Facility permit conditions
 - Anticipated new or amended regulations
- Progress voluntarily took early action toward a 45% methane reduction target by enhancing its FEMP

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How our FEMP Works



- Third-party service providers
- Annual surveys of larger facilities
- Optical imaging for leak detection
- Hi-Flow sampler for leak quantification
- Documentation of leaks and vents
- Leak repairs
- Data retention
- Reporting



Jedney A-065-1/94-G-01
Compressor Station
October 2016

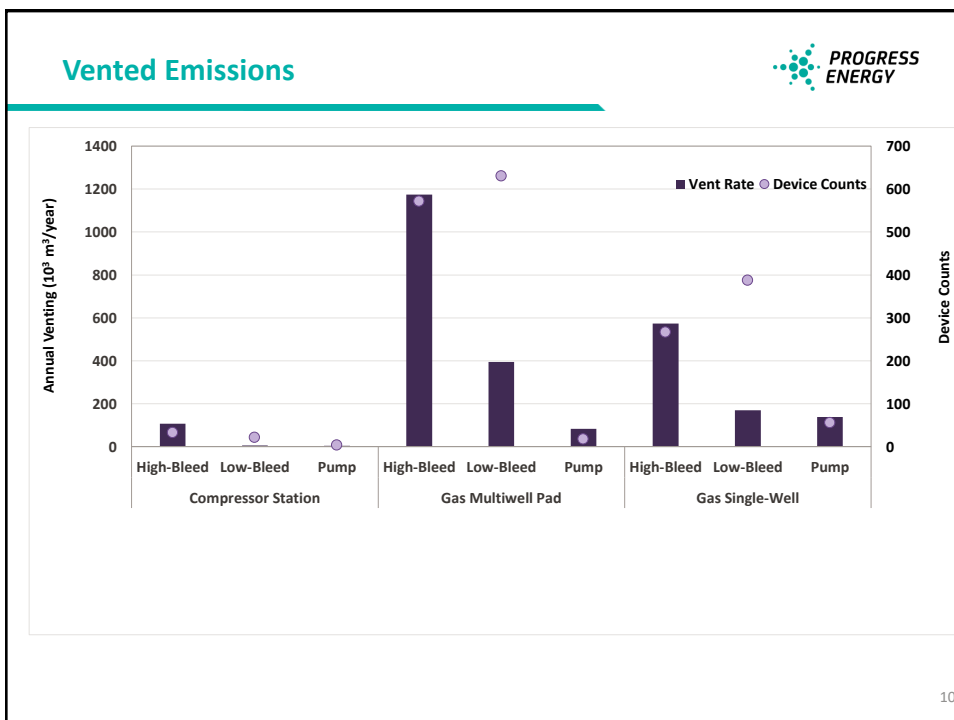
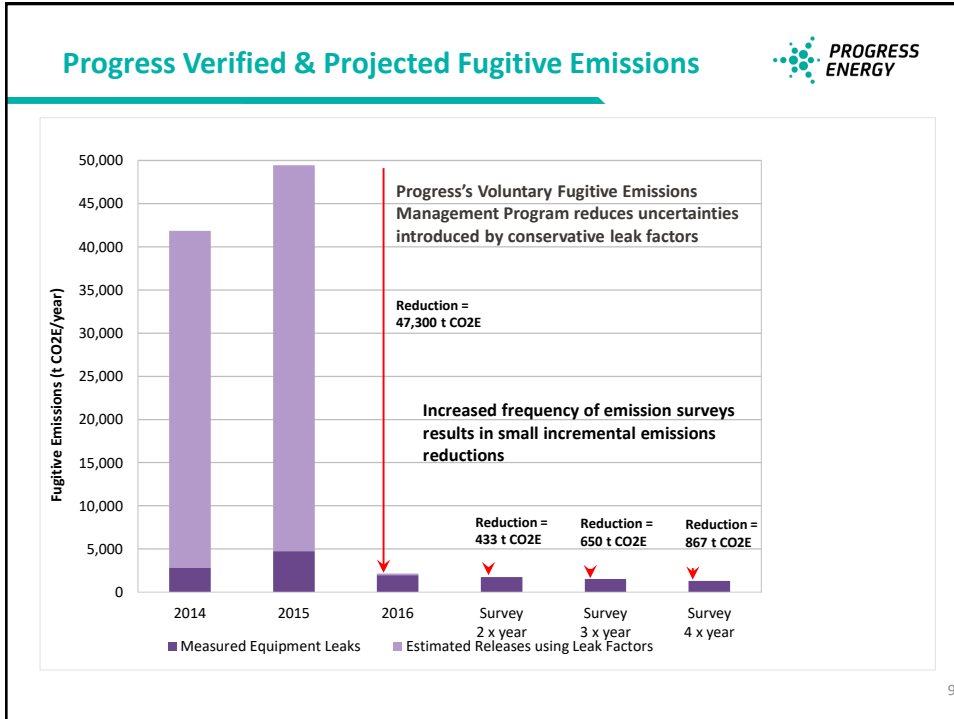
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2016 Size and Scope of FEMP



- Setting a measured fugitive emissions baseline
 - Corporate focus on greenhouse gas emissions management
 - All operating facilities down to the single well level were surveyed, including quantification
- Checking for compressor scrubber dump valve leakage
- Major equipment counts collected
- Some wellsite component counts were collected
- The inspection program ran from May until November

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B.C. Methane Reduction Target



Industry target:

Reduce fugitive and venting emissions from infrastructure built before January 1, 2015 by 45% before 2025

➤ Progress reduced its emissions by **54%** by 2016



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Common Misperceptions



- Fugitive emissions are large and under reported
- To reduce fugitive emissions, comprehensive leak detection surveys need to be done at all facilities multiple times per year
- Surface casing vent flow emissions are high and not reported
- Solar pumps are unreliable and will not work in the north

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Planned Methane Reduction Activities



Replacement of Pneumatic Chemical Pumps with Solar Pumps

- Solar pump greenhouse gas emissions are zero

Installation of Compressor Seal Packing Vent Recovery Systems

- Vent gas will be zero for these units

Evaluation of Pneumatic Device Options

- High to low bleed conversions
- Zero bleed conversions

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Summary



What we have learned:

- A risk-based survey approach is the most cost effective
- Survey frequency must be risk and performance based
- Collaboration among industry, government, and academia is key to success
- Progress is open to piloting new technologies that are rapidly advancing

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Questions



Thank you

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