

# Reducing CO<sub>2</sub>: Present and Future



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# About Sobeys Inc.

- Established in 1907
- One of Canada's two national grocery retailers
- \$17 Billion (CAD) in annual sales
- 38.7 Million ft<sup>2</sup>
- 124,000 employees
- More than 1,500 stores across all 10 provinces, as well as more than 330 retail fuel locations
- Retail banners include Sobeys, Safeway, IGA, Foodland, FreshCo, Thrifty Foods, and Lawton's Drugs



# Canadian Environment

- ASHRAE Climate Zones

- 5 (Vancouver, British Columbia)
- 8 (Whitehorse, Yukon Territories)

- Energy (average cost)

- Electricity (at plug): \$0.07 to \$0.15/kWh
- Natural Gas (at burner tip): \$0.02 to \$0.08/kWh (\$6 to \$23/GJ)

- CO<sub>2</sub>

- Electricity: 0.841 (Alberta) to 0.002 (Manitoba) CO<sub>2e</sub> tonne/kWh
  - 420:1 ratio
- Refrigerant: 3.3 (R507) to 0.0010 (R744 / CO<sub>2</sub>) CO<sub>2e</sub> tonne/kg
  - 3,300:1 ratio
- Taxes: \$0.00/tonne (at present; but significant future risk)

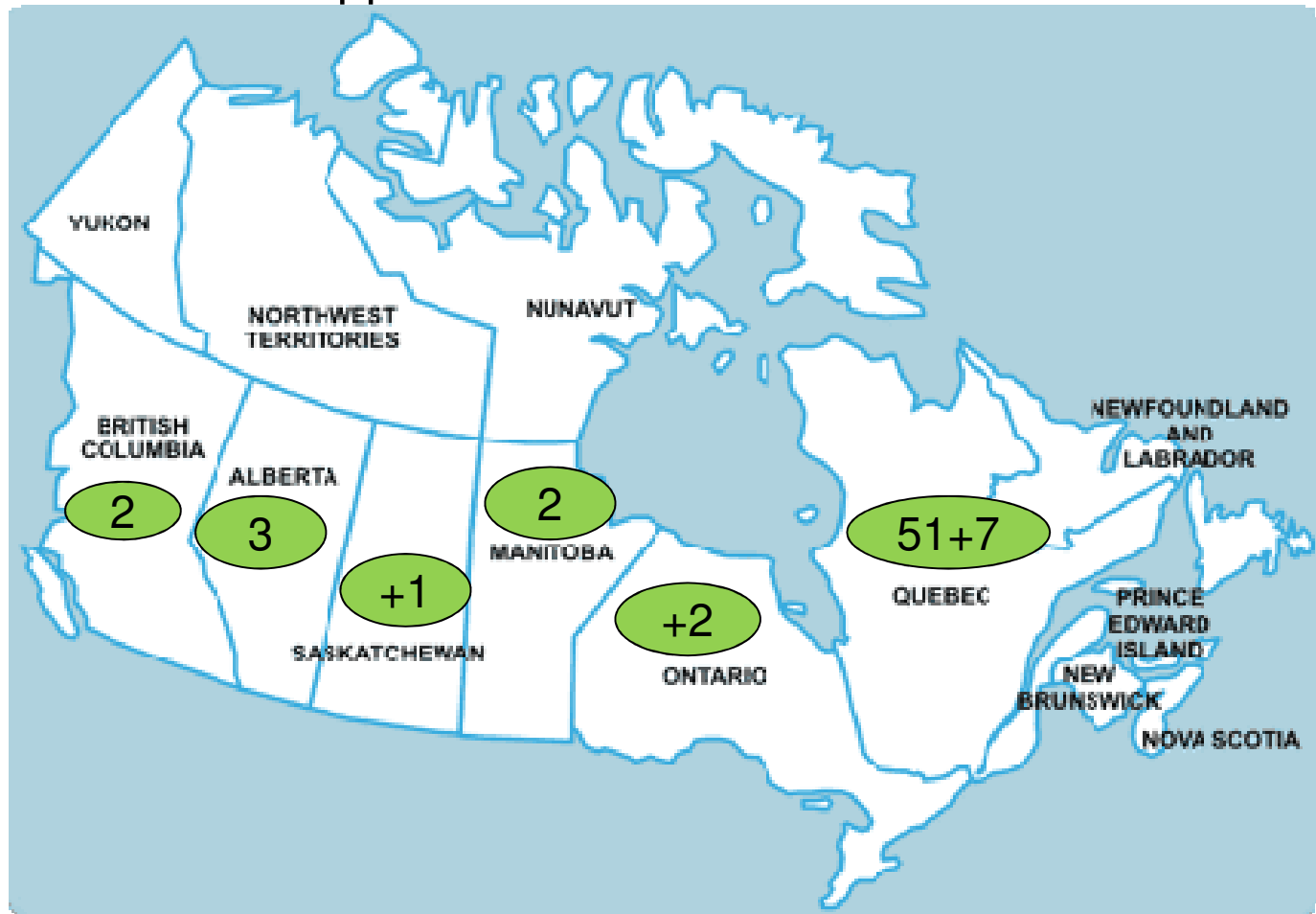
- Energy Usage (Sobeys)

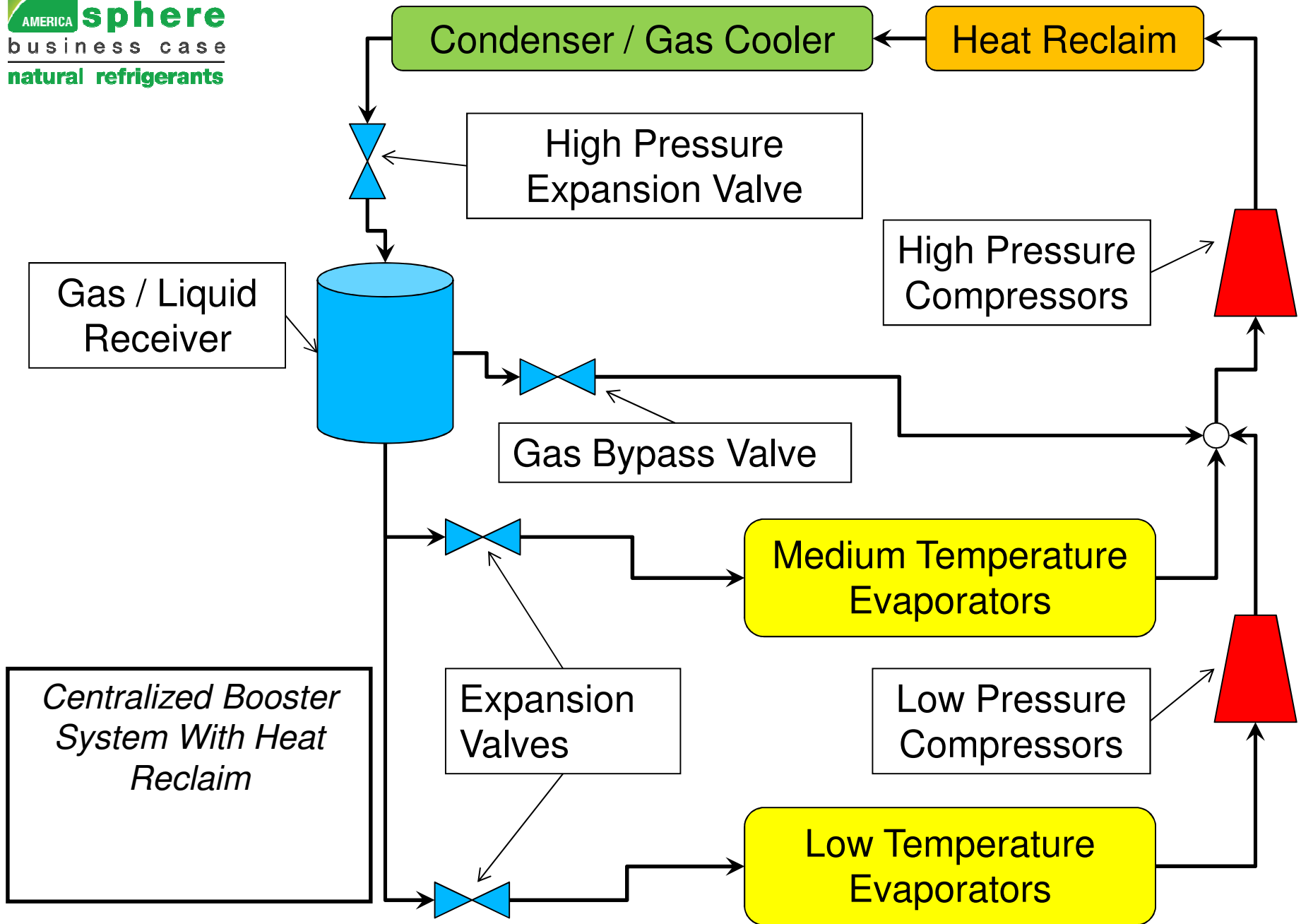
- Refrigeration: >60% (we have a refrigeration rich environment)



# Transcritical CO<sub>2</sub>

- Current State (May 31, 2014): 58 systems
  - 4 sites US EPA GreenChill Platinum certified
- Remainder of CY2014: 10 systems
  - 2 sites approved for GreenChill Platinum certification





# Transcritical CO<sub>2</sub>

- Heat Reclaim
  - CO<sub>2</sub> has a high rejection heat, which makes it ideal for heat reclaim
  - Domestic Hot Water
    - CO<sub>2</sub> to water heat exchanger
    - Year round: Production equipment cleaning
  - HVAC
    - Primary roof top unit
    - CO<sub>2</sub> to air heat exchanger
    - Winter: Heating
    - Summer: Post dehumidification reheating
- Standard for all new Full Service Format stores

# Summary

- CY2014/2015

- Using all three major North American system suppliers
- Rack pricing down 17% from 2011, but still significant cost differences between supplies
- Internal Benchmarking: costs (first / installation / startup / first year), overall system efficiency, etc.

- An ASHRAE Must Read

- Advanced Energy Design Guide For Grocery: Achieving 50% Energy Savings Toward a Net Zero Energy Building

- Key Drivers

- Energy Conservation: Reducing energy saves \$ and CO<sub>2e</sub>
- Refrigerant:
  - R507:R744 (CO<sub>2</sub>) → 3,300:1 tonne/kg CO<sub>2e</sub>
  - R507:R744 (CO<sub>2</sub>) → 4:1 \$/lb

**Energy conservation + natural refrigerants is the winning combination for customers, shareholders and the environment**



business case

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**natural refrigerants**

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Thank you very much!