

A photograph of an industrial facility, likely a refinery or chemical plant, silhouetted against a bright sunset. The sun is low on the horizon, creating a lens flare effect. A vibrant rainbow is visible in the upper left corner of the sky. The industrial structures include tall distillation columns, piping, and scaffolding. A plume of white steam or smoke rises from one of the central structures. The overall scene is dramatic and atmospheric.

Action plan to reduce benzene emissions

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Presentation Overview

- Presentation of Suncor – Montreal refinery
- Context
- Benzene emissions sources distribution
- Evolution of benzene emissions
- Actions for reduction

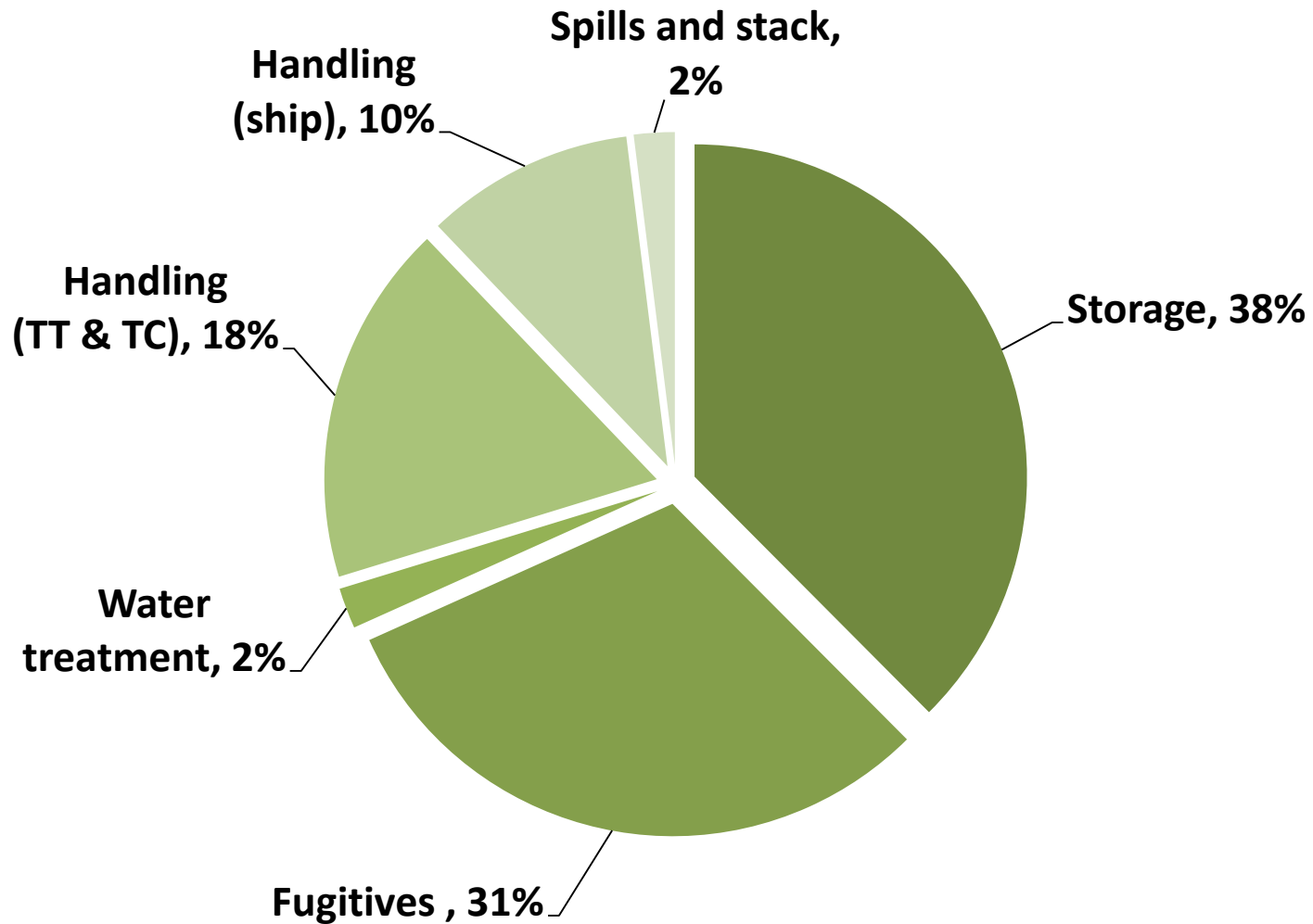
Presentation of Suncor – Montreal refinery

- **1955** - The Montreal Refinery production began with Petrofina Canada Ltd with an initial capacity of 20,000 barrels a day;
- **1970** - The Montreal Refinery started to manufacture petrochemicals such as benzene, toluene and xylene;
- **1981** - Petro-Canada acquired all the assets of Petrofina, including the Montreal Refinery;
- **2009** - Suncor Energy and Petro-Canada merged all their activities. The Montreal refinery now operates and trades under the Suncor Energy name and Petro-Canada brand is maintained for the retail network;
- **2014** – The actual capacity of the Montreal Refinery is roughly 130,000 barrels a day

Context

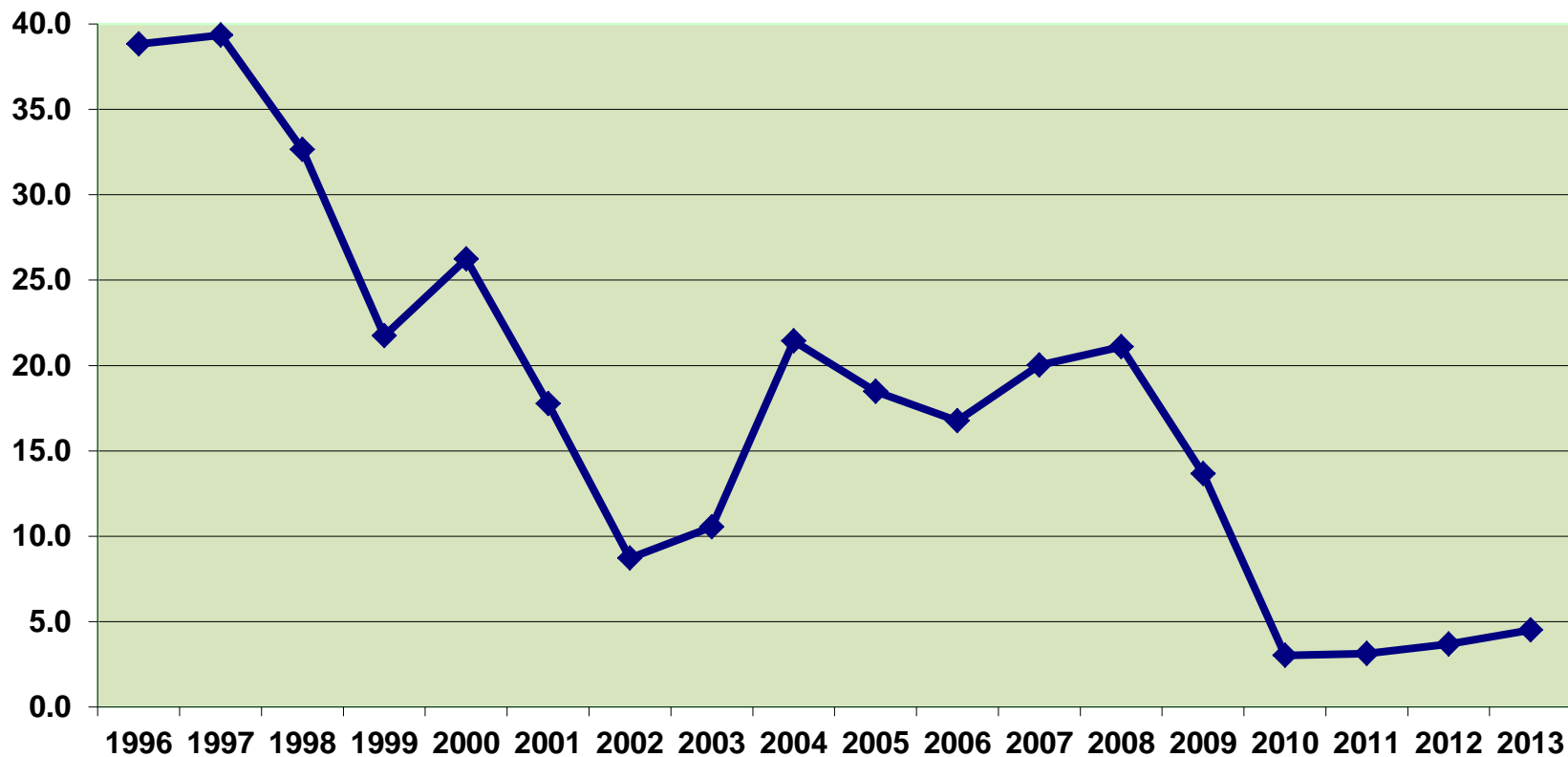
- **1994** - Environment Canada published a report on benzene concentration measured at several ground monitoring stations across Canada:
 - *The highest ground level concentration was measured at the Boul. St-Jean Baptiste station*
- **1994** – The City of Montreal asked local industries to implement voluntary measures to reduce benzene emission;
- **1995** – Petro-Canada adopted the Code of Practice developed by the Canadian Council of Ministers of the Environment (CCME);
- **1997** – Petro-Canada signed a Partnership agreement with the City of Montreal and the Quebec Ministry of Environment.

Benzene emissions sources distribution - 1995



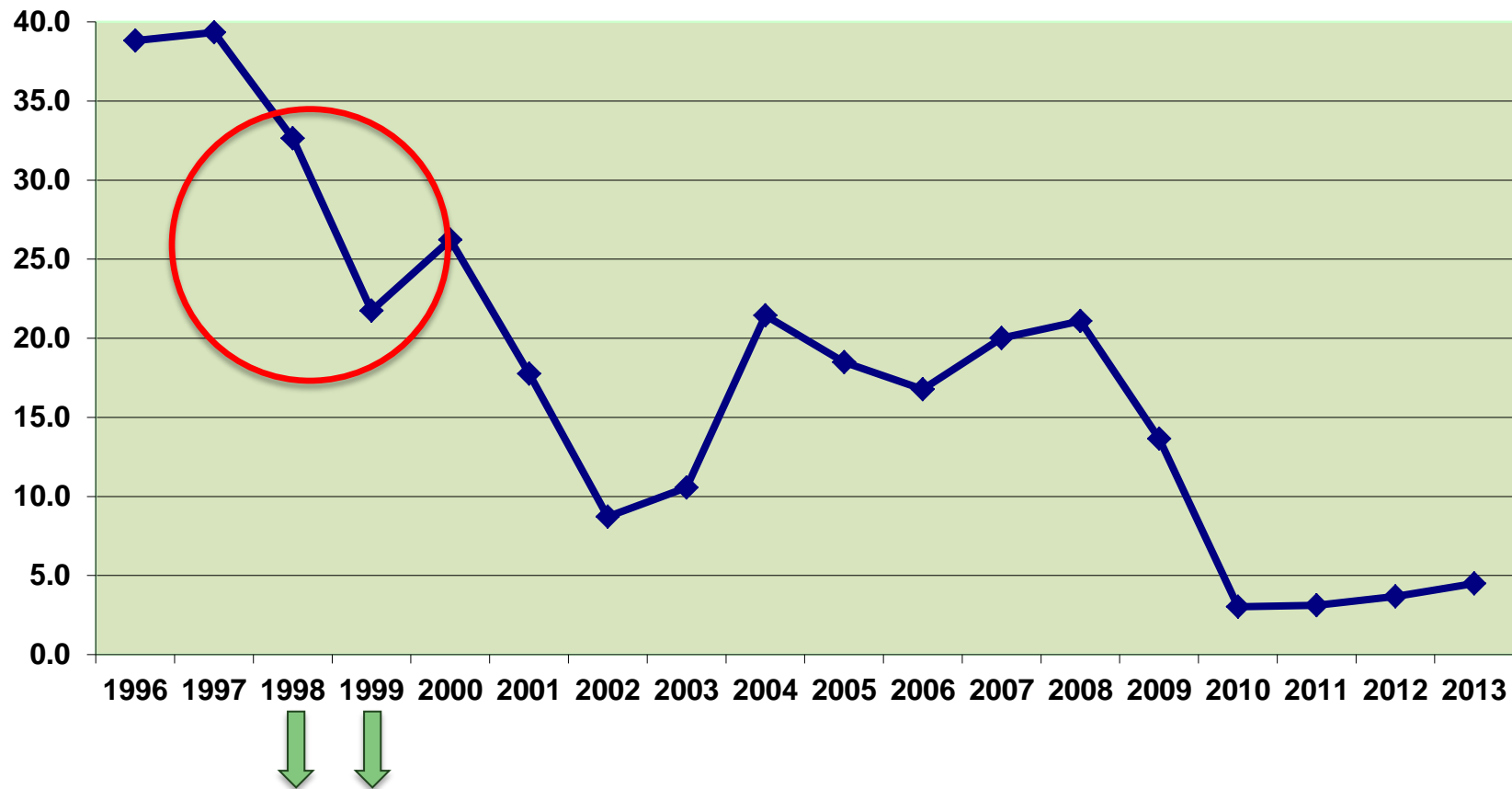
Evolution of benzene emissions

Benzene Atmospheric Emissions (tons/yr)



Evolution of benzene emissions

Benzene Atmospheric Emissions (tons/yr)



Actions taken to improve benzene emissions reduction

- **1997, 1998, 1999**

Storage: reduction of 97%

- Double seals on all the benzene tanks' floating roofs
- Regulation for the reduction of benzene in gasoline

- **1999**

Handling (trucks) : reduction of 98 %

Vapor recovery unit for tank-truck and tank-car with benzene loading activities

Benzene tank primary seal on floating roof

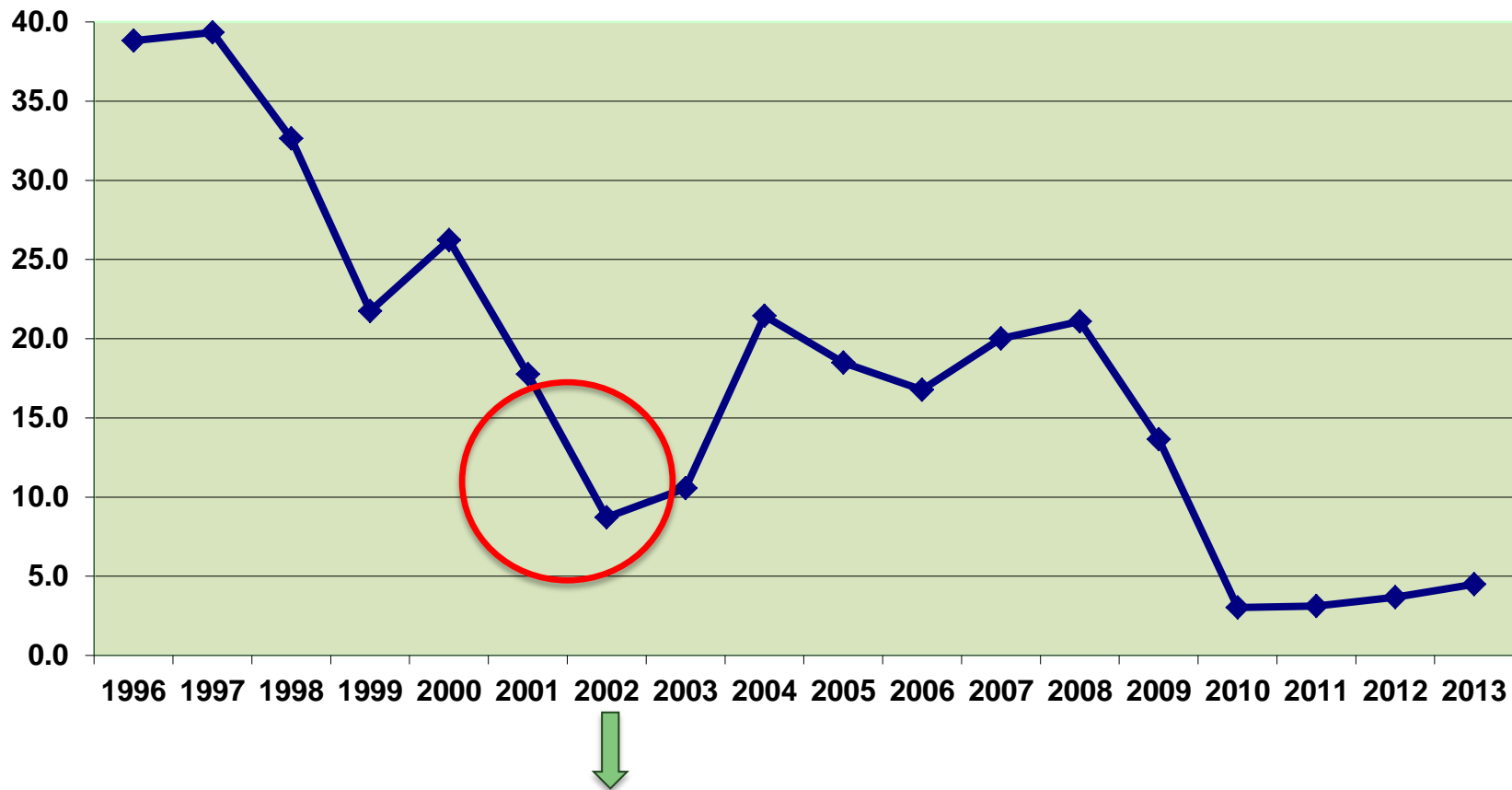


Benzene tank secondary seal on floating roof



Evolution of benzene emissions

Benzene Atmospheric Emissions (tons/yr)



Actions taken to improve benzene emissions reduction

- **2000 - 2002**

- **Fugitive emissions** : reduction of 87%

Leak detection and repair program (LDAR) – more than 34,000 points are measured each year. In 1997, 682 leaks were identified at the aromatic unit and in 2000, leaks were reduced by 95%

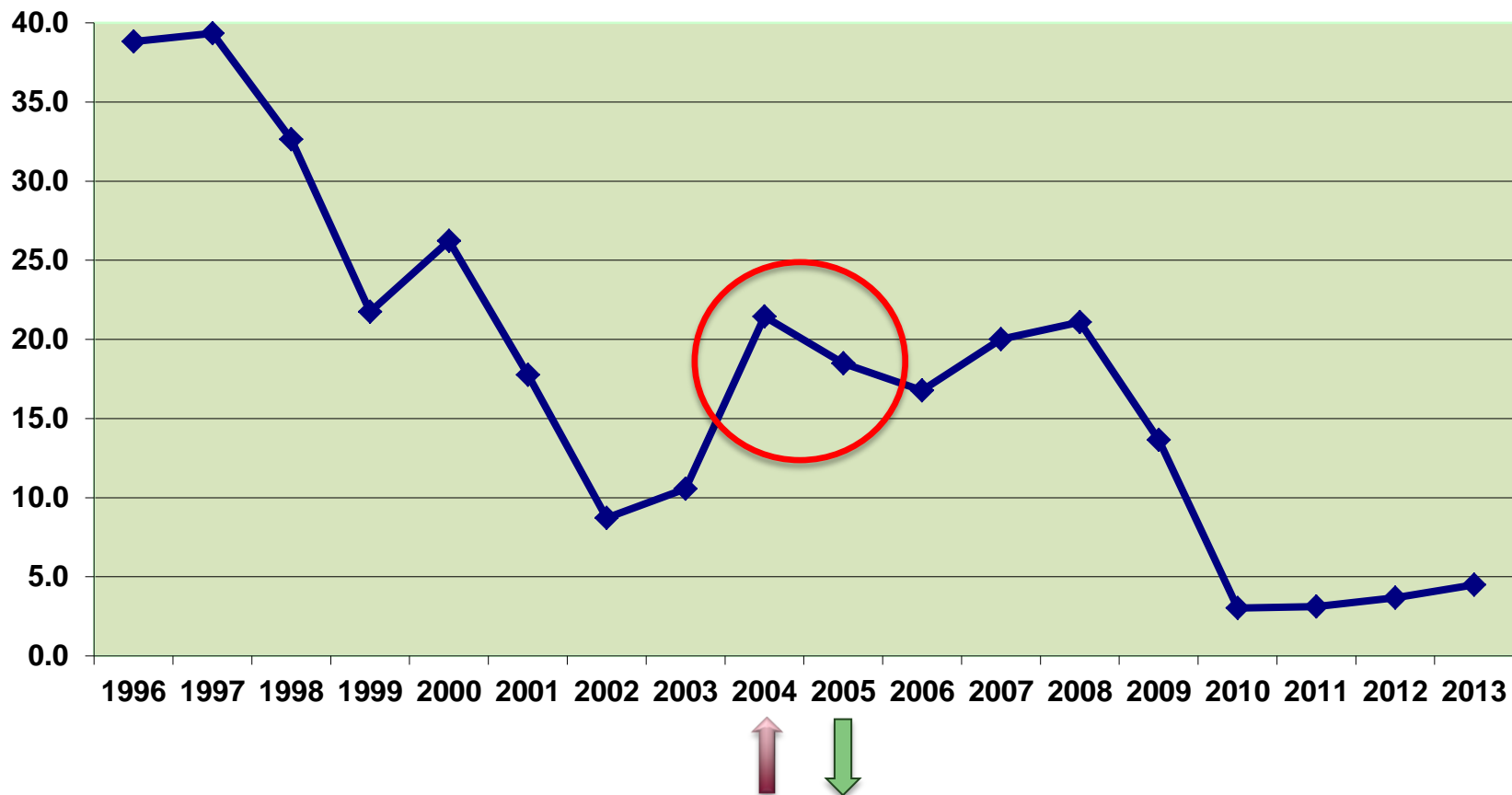
- Procedure to drain benzene into a closed loop
- Double mechanical seals on all pumps that handle benzene
- Cooling water monitoring to ensure water is free of benzene

- **2002**

Tank-car vapor recovery unit for tank-truck and tank-car with benzene loading activities

Evolution of benzene emissions

Benzene Atmospheric Emissions (tons/yr)



Actions taken to improve benzene emissions reduction

- **2004**

- **Handling (ships)** : increase of 87%

Increase of benzene sales

Benzene temperature increased from 65°F to 80°F

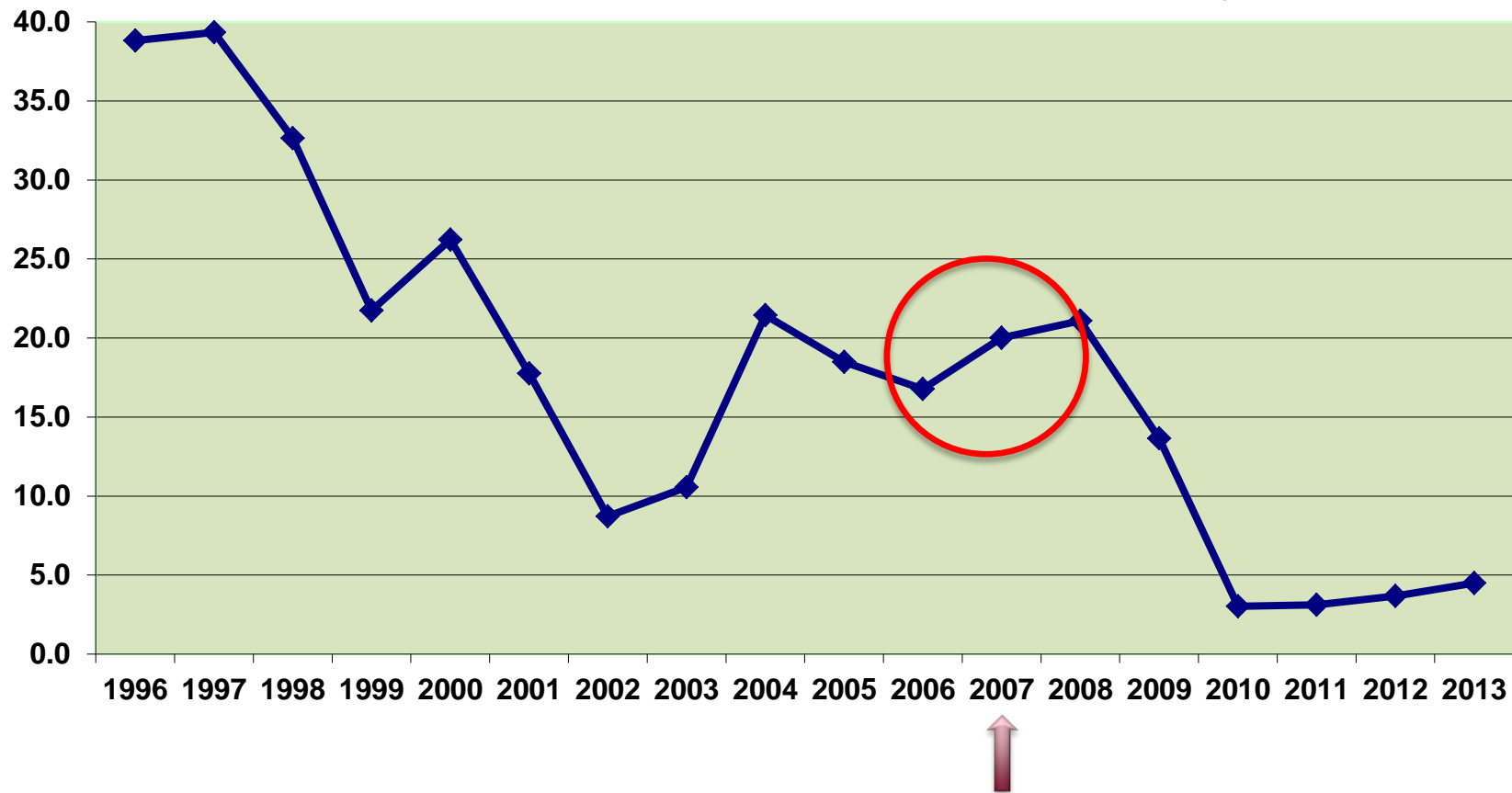
- **2005**

- **Water treatment** : reduction of 75%

Automatic skimmers remove oil from the surface of the oily water separators before it evaporates

Evolution of benzene emissions

Benzene Atmospheric Emissions (tons/yr)



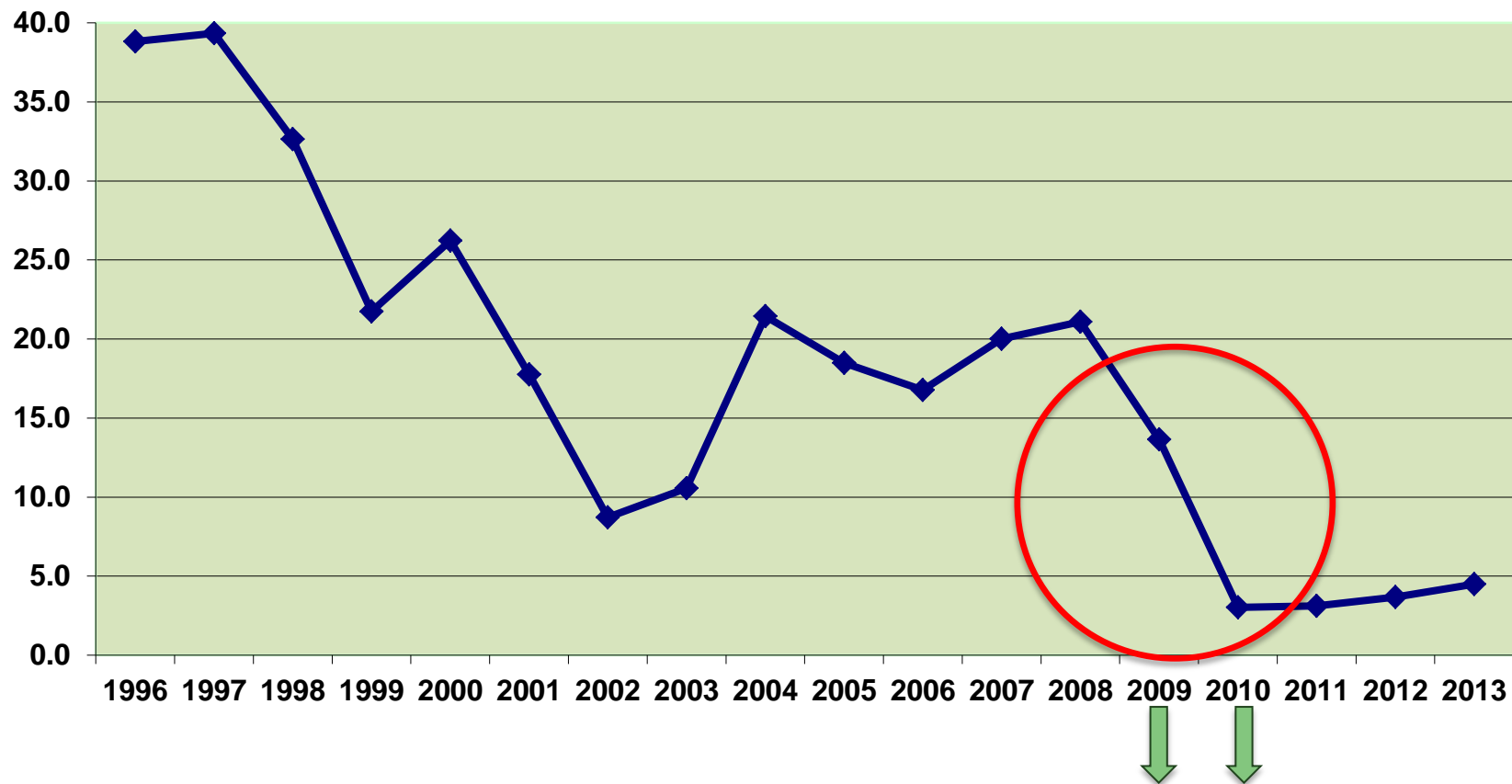
Actions taken to improve benzene emission reduction

- **2007**
 - **Handling (ships)** : increase of 38%

Started receiving benzene from Parachem

Evolution of benzene emissions

Benzene Atmospheric Emissions (tons/yr)



Actions taken to improve benzene emissions reduction

- **2009 to 2010**
 - **Handling (ships) :** reduction of 99%

A vapor recovery unit installed at the dock for benzene loading activity in association with Parachem

- **2010**
 - **Water treatment :** reduction of 53 %

A floating roof installed at the oily water separator

Oily water separator



VRU – vapor recovery arm



VRU – absorption column and activated bed



Actions taken to improve benzene emissions reduction

- The period from 1995 to the present day has been marked by many projects aimed at ensuring environmental protection.
- Rules and regulations, voluntary actions and good communications contributed to improve the air quality
- From 40 tons a year, total benzene emissions reduced to +/- 4 tons a year since 2010
- Overall reduction of 90%
- Continuing effort on spill awareness campaign

Questions?

Thank you