Arizona Department of Environmental Quality
Pollution Prevention (P2) Program

April 8, 2015

Presentation Outline

- Arizona P2 Policy
- P2 program thresholds
- Review of P2 Plan sections
- P2 Plan maintenance
- P2 program facility successful goals examples
  - Hazardous waste reduction
  - Toxic substance use reduction
  - Solid waste diversion
  - Natural resources conservation
- P2 promotion and benefits
- Question and answer session

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Why P2?

- Since the early 1970's, environmental protection programs in the U.S. have been directed primarily at *controlling* not *preventing* pollution.
- Pollution control programs, in general have consisted of end-of-pipe approaches including treatment, discharge and disposal.
- Overall, these techniques have been effective, but environmental protection challenges still remain.

What is P2?

1990 Federal P2 Act

- Pollution should be prevented or reduced at the source whenever feasible

P2 is reducing or eliminating waste at the source by:

- modifying production process
- promoting the use of non-toxic or less toxic substances
- implementing conservation techniques
- Re-using materials instead of putting them in the waste stream

- EPA's definition

Arizona State P2

In 1991, Arizona initiated one of the broadest P2 programs in the nation and adopted a P2 policy:

Arizona Revised Statutes (A.R.S.) §§ 49-961 to 49-969

- Toxic substance use reduction
- Hazardous waste generation reduction

What is P2 in Arizona?

P2 in Arizona

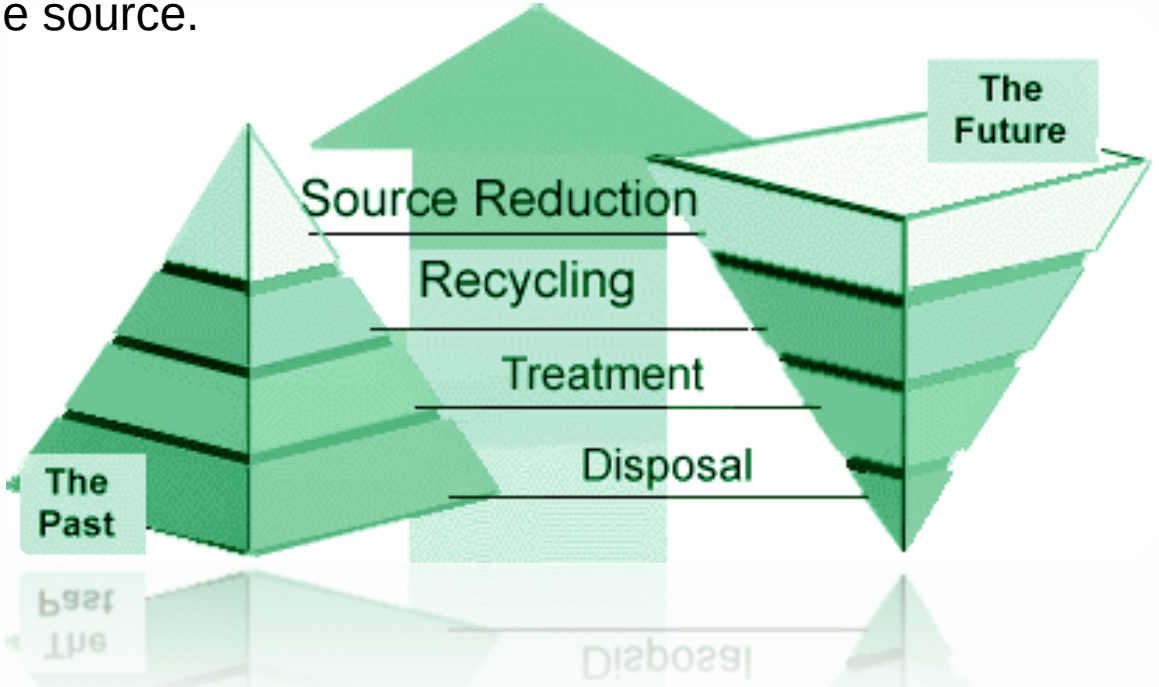
Any operational procedures and processes and improvements in housekeeping or management techniques that reduce potential or actual releases of pollutants to the overall environment including all air, water and land resources affected by those pollutants.

Waste Management Hierarchy

- Preventing pollution offers important economic benefits
  - ✓ Pollution never created avoids the need for expensive investments in waste management or cleanup.

- EPA's P2 Act is source reduction focused and does not include recycling in the definition of P2; however, Arizona does include recycling as P2.

- Educating industry and the general public on P2 is necessary to change from a culture that tolerates pollution to a sustainable one which increasingly eliminates pollution at the source.



Arizona P2 Program Plan Filing Thresholds

1. Filed a Toxic Release Inventory Form (form R or A)

A.R.S. §49-962(A)(1)

If the owner or operator of a facility was required to file an annual Toxic Release Inventory (TRI) form (Form A or Form R) to EPA during the preceding calendar year, the facility must prepare and implement a P2 Plan.

2. Hazardous Waste Generators

A.R.S. §§49-962 (A)(2) and 49-963(B) and (C)

A facility that generated or shipped off-site for purposes other than recycling an average of 2,200 pounds (1,000 kg) per month of hazardous waste or an average 2.2 pounds (1 kg) per month of acute hazardous waste during the preceding calendar year, must prepare and implement a P2 Plan.

3. Toxic Substance Users

A.R.S. §49-963(D)

If the facility used in excess of 10,000 pounds of a TRI listed chemical during the previous calendar year, the facility must prepare and implement a P2 Plan.

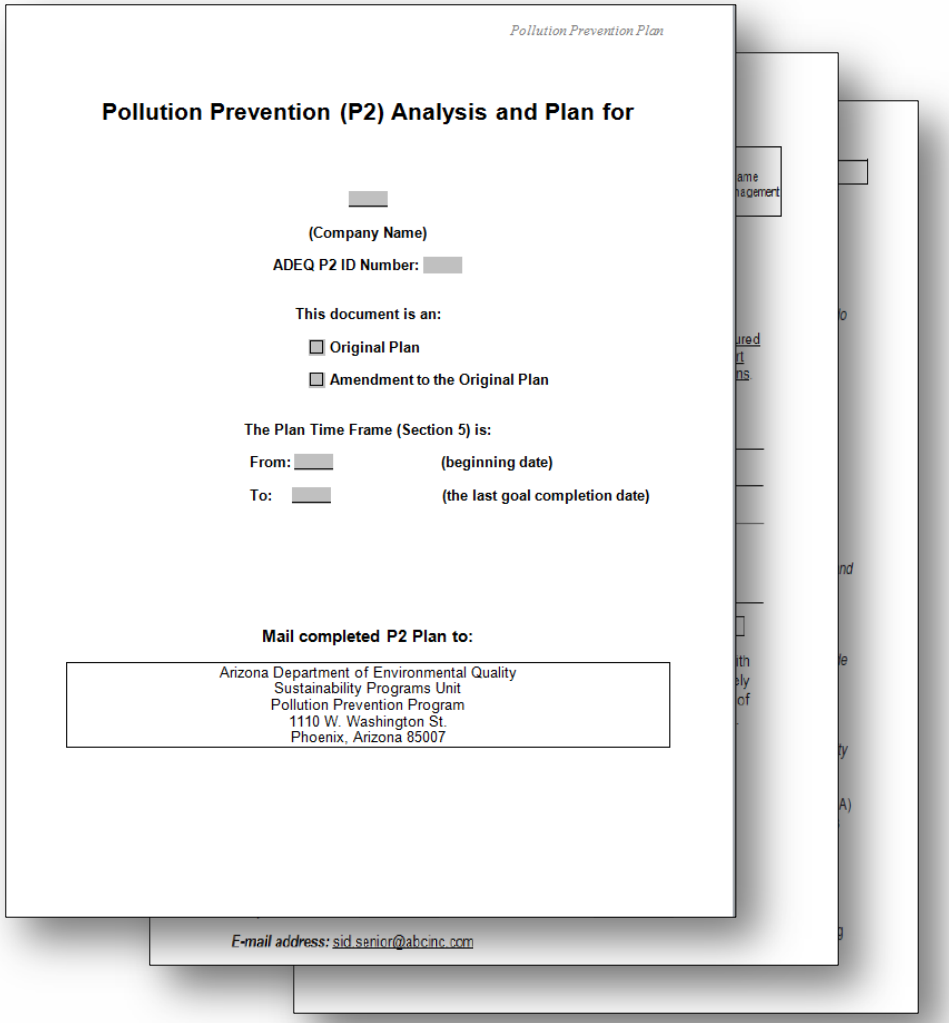
What is a P2 Plan

- Stand alone management document that provides facility specific information
- Analyzes work practices, processes and operations
- Outlines potential for P2 opportunities and goals
- Required to maintain as long as facility meets P2 Plan filing thresholds
- Required minimum of two years

Contents of the P2 Plan

ADEQ developed template based on A.R.S. §49-963(J) requirements consisting of:

1. Facility contact information and management certification
2. Facility general information
3. Pollution prevention policy
4. Management and corporate support
5. Scope and objectives
6. Analysis and opportunity development
7. Performance goals
8. Management practices and procedures
9. Employee awareness and training programs
10. Existing P2 activities



Pollution Prevention Plan

Pollution Prevention (P2) Analysis and Plan for

(Company Name)

ADEQ P2 ID Number:

This document is an:

☐ Original Plan

☐ Amendment to the Original Plan

The Plan Time Frame (Section 5) is:

From: (beginning date)

To: (the last goal completion date)

Mail completed P2 Plan to:

Arizona Department of Environmental Quality
Sustainability Programs Unit
Pollution Prevention Program
1110 W. Washington St.
Phoenix, Arizona 85007

E-mail address: sid.senior@abcinc.com

The path to a successful P2 Plan

#1
Management Support

#2
Use of a P2 Champion

#3
Implement P2 team/ "green team"

#4
Identify waste streams, emissions and toxic substance use

#5
Why do waste streams, emissions and toxic substance use exist?

#6
Select P2 opportunities that are economically and technically feasible

#7
Develop goals and establish completion dates

#8
Implement tracking process for goals

#9
Recognize accomplishments and re-evaluate program

Maintaining the P2 plan

Annual Toxic Data Reports (TDR's) due by July 1st of each year

(Reminders sent out in April/May months by a P2 case manager)

- **Progress report instructions**
- **Progress report cover sheet**
- **Goal forms**
  - ✓ Goal status (*on-schedule*, *completed*, *delayed*, *dropped*)
  - ✓ Reductions achieved including cost savings
- **Amendment** (if necessary)
  - ✓ Changes to existing Plan
  - ✓ Extend the timeframe of an existing Plan
  - ✓ Add new goals or amend existing goals
- **TRI submittal**
  - ✓ Electronic submittal through TRI-ME Web
  - ✓ Trade secret TRI's hard copy submitted to State

Tracking and Reporting Reductions

Why do reductions need to be reported?

- Reductions reported by P2 program facilities by July 1st of each year
- Reductions tracked in: Pounds, gallons, therms or kilowatt hours
- Reported to EPA annually
- Reductions reported to P2Rx
- Reductions used to gauge goal improvement at facility
- Measured against facility defined baselines in Plan

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Pollution Prevention Examples

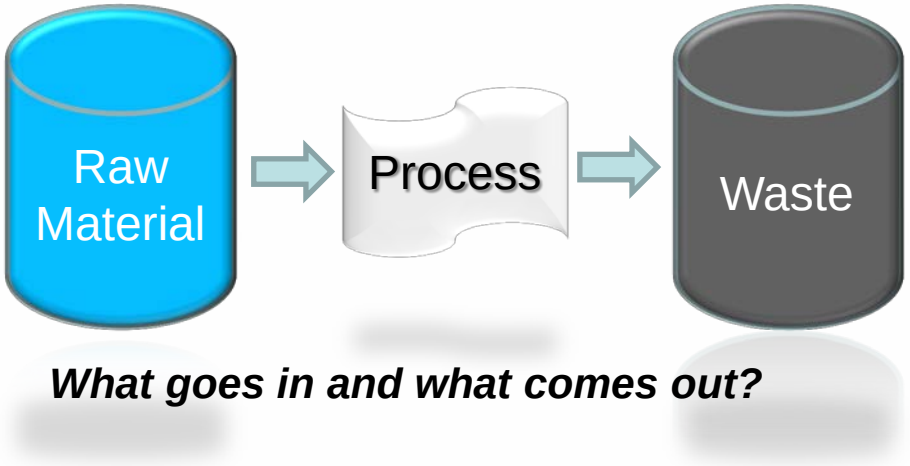
P2 for Hazardous Waste Generation

How can facilities incorporate P2 goals in the area of hazardous waste generation?

Determine root cause of hazardous waste generation

Research

- Process changes
- Recover materials – *reclamation*
- Reuse
- Recycling
- Spill and leak control
- Inventory control to prevent expired materials
- Identify if waste is characteristic for a hazardous waste



What goes in and what comes out?

7,802,527 pounds of hazardous waste were avoided in 2013 as a result of successful goals by facilities in the P2 program

Successful hazardous waste reduction examples by facilities in the P2 Program

A semi-conductor facility eliminated **2,251,351** pounds of hazardous waste by acquiring a wastewater treatment system to reduce the volume of metals-contaminated wastewater and reclaiming metal sludges.

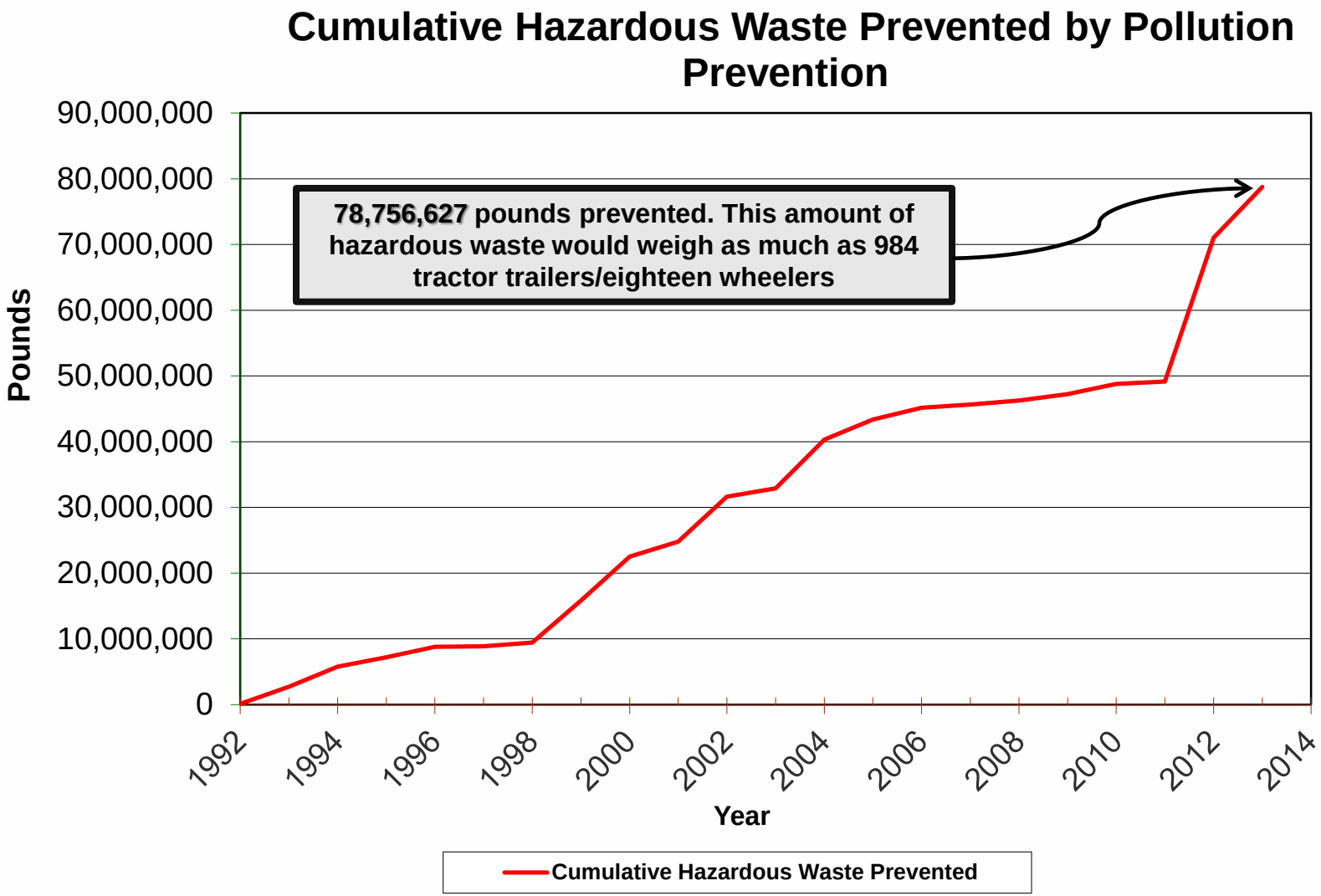
This resulted in a cost savings was **$445,411** in 2013

Another facility specializing in the production of laminate materials for use in the electronics industry reduced hazardous waste by reusing flushed solvents.

This resulted in **1,500** pounds of hazardous waste recycled in 2013 and a cost savings of **$65,000**.

Eight hospital facilities owned by the same health organization were able to fall out of out P2 Plan filing program by instituting better practices for segregating and counting their acute hazardous waste generation. In 2013 and 2012 all their facilities combined generated approximately **2** pounds of acute hazardous waste compared to 2011 when they generated **29,080** pounds of acute hazardous waste

Cumulative Hazardous Waste Prevented 1992-2013



P2 for Toxic Substance Use

Determine TRI chemicals and if there is an opportunity for:

- Source reduction
- Reformulations to include non-toxic substances
- Toxic substance substitution/green chemicals
- Toxic substance use below thresholds
- Quality control / Quality assurance

903,762 pounds of toxic substance use was prevented in 2013 as a result of successful goals by facilities in the P2 program

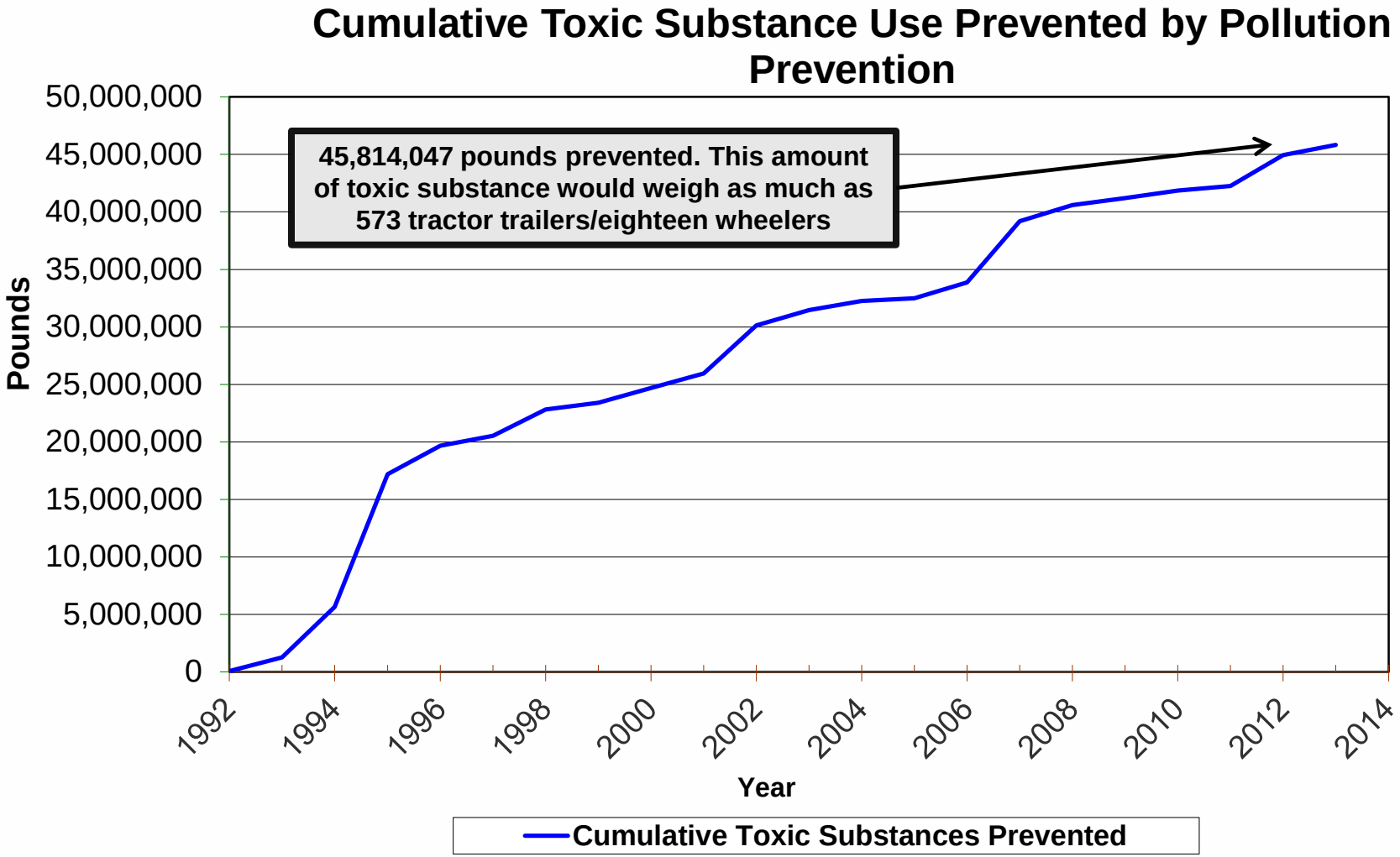
Successful toxic substance use reduction examples

A cable manufacturing facility successfully substituted leaded aluminum bar stock (used for machine cable TV connector components) with ones that contained either ~~a~~ reduced lead or are lead free by 80%. In 2013, **309,730** pounds of lead were reduced.

Another facility was able to replace solvents used in cleaning locomotive and railcar parts with non toxic cleaners. This resulted in **35,400** pounds of toxic substance use reduced in 2009.

Reducing the use of toxic substances saves money, energy and improves company image

Cumulative Toxic Substance Use Prevented 1992-2013



P2 and Solid Waste Reduction

Any facility can incorporate solid waste reduction goals including:

- **Source reduction**
  - Inventory control
  - Effective procurement practices – avoid excess supplies
- **Recycling/Reuse**
  - Paper – company double-sided copying/printing policy
  - Metal
  - Plastics
  - Pallets/wood
  - Drums/storage containers
- **Reduce Packaging**
  - Order bulk merchandise
  - Minimize packaging for company products
  - Recycle/return cardboard boxes and foam peanuts for reuse
- **Food waste reduction**
  - Food donation
  - Food composting
- **Company wide recycling program**
  - Aluminum cans/plastics/bags/cardboard
  - Educate employees
- **Conduct a waste assessment**
  - Understand purpose
  - Determine the approach
  - Plan
  - Review records
  - Review waste streams
  - Document waste assessment
  - Take action

41,244,743 pounds were diverted from the landfill in 2013 as a result of successful goals developed by facilities in the P2 program

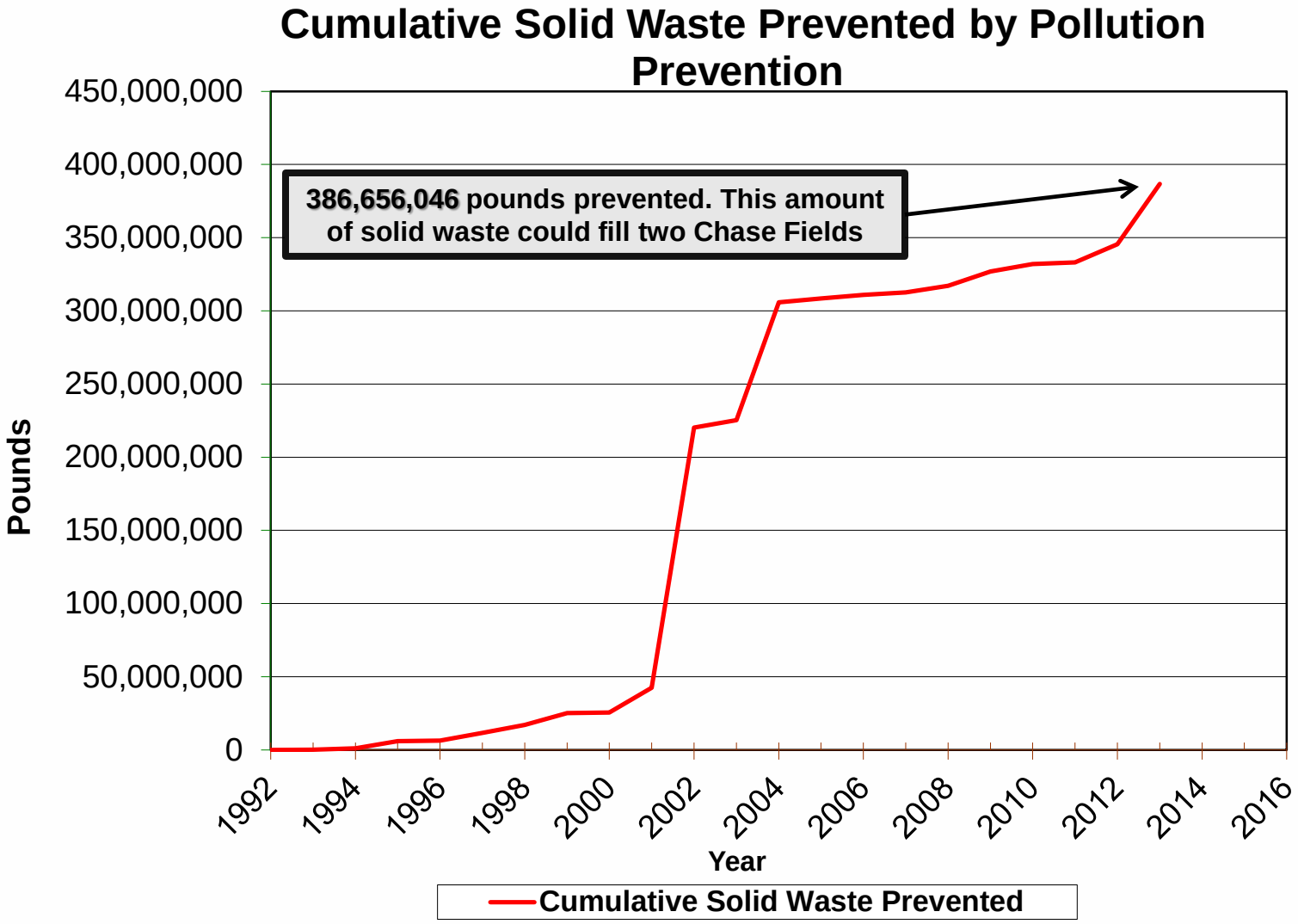
Successful solid waste reduction examples by facilities in the P2 program

A spa manufacturing facility was able to recycle 90% of the High Density Polyethylene (HDPE) plastic waste from their panel cutting operation. This resulted in **6,637** pounds reduced in 2013 and a cost savings of **$1,659**.

A transportation facility was able to reduce 100% of the pallets sent for incineration. The facility established a mandatory take back program with the vendor and all pallets are recovered. In 2013 the facility returned **43,200** pounds of pallets to the vendor.

One facility was able to develop a new recycling program incorporating cardboard and plastic containers in employee break rooms and in the warehouse areas. This resulted in a reduction of **61,921** pounds in 2013 and cost savings of **$1,800**.

Cumulative Solid Waste diverted from the landfill 1992-2013



P2 for Natural Resource Conservation

Natural resource conservation can lead to significant reduction in use in the areas of:

- Energy
- Natural gas
- Water
- Natural resources




Natural Gas and Energy Conservation

Why energy conservation?

Most energy derives from non-renewable sources such as fossil fuels. Energy conservation reduces green house gas emissions, conserves resources and saves money.

Ways to conserve energy at facilities:

- Technology improvements
  - ✓ Replacing old machines with efficient ones
- Improved lighting e.g. fluorescent to LED
- Work schedule changes
- Solar and wind energy
- Maintain high energy-driven items
- Energy efficient electronics with energy star label

Ways to conserve natural gas:

- Check blower efficiency
- Make sure condensers are working correctly
- Recover energy from waste exhaust gases

90,491,274.25 KWh and 4,382,039 therms of energy were conserved in 2013 as a result of successful goals developed by facilities in the P2 program

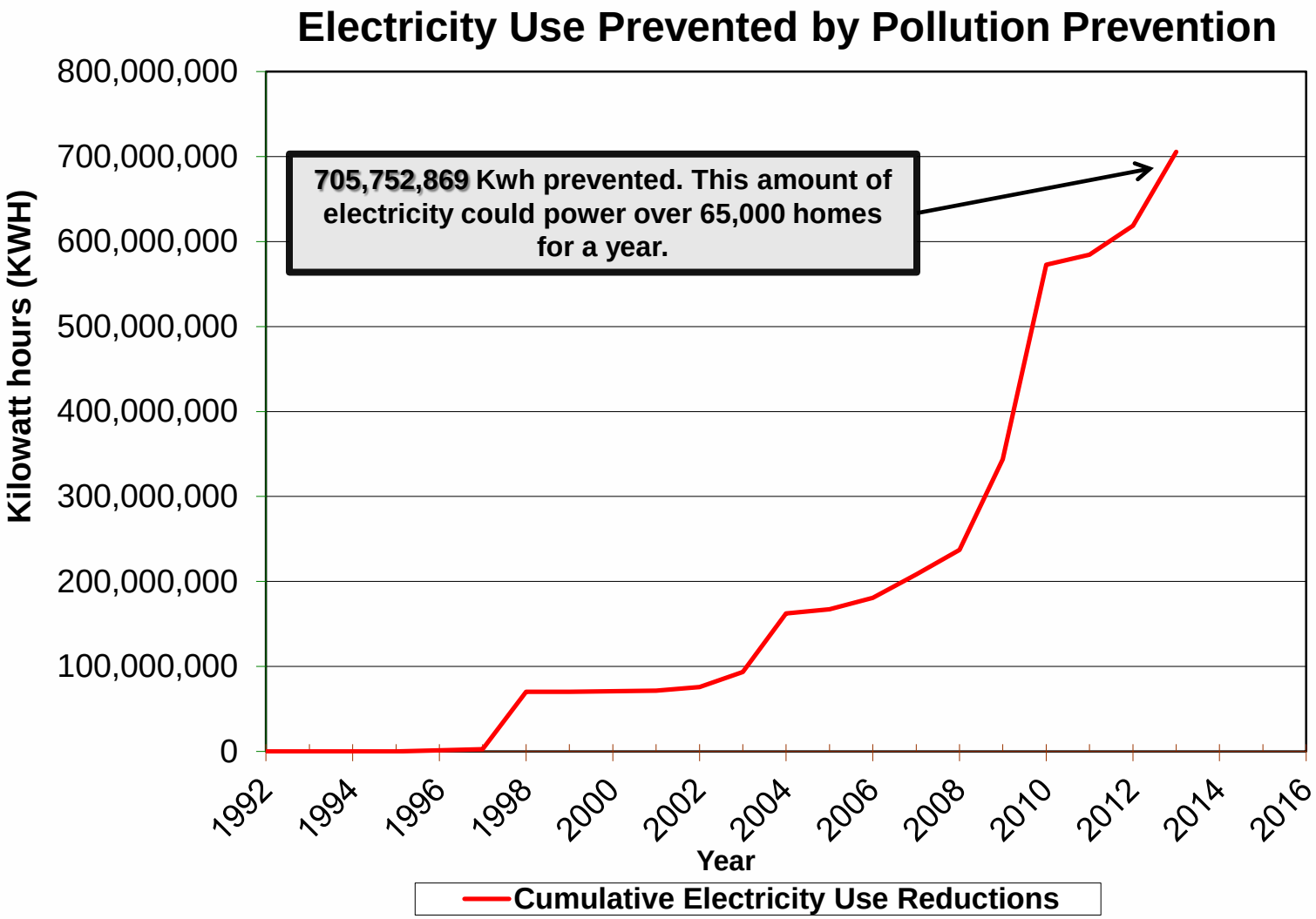
Successful natural gas/electricity reduction examples by facilities in the P2 program

A food manufacturing facility repaired their condensate pump to increase the condensate return to boiler water feed for more uniform boiler temperature. In 2010, **824,813** therms of energy were reduced. They also installed an air flask system so the compressors ran fully loaded (36 minutes per hour versus 51 minutes per hour) resulting in an annual savings of **$9,000**.

A weapon manufacturing facility was able to reduce their electrical energy use by replacing older machinery with more energy efficient machinery. They also installed motion sensor lights for specific areas of the factory floor. This resulted in a reduction of **173,844** Kwh in 2013 and a cost savings of **$13,907**

Increase the reliance of renewable and clean energy

Electricity use prevented 1992-2013



Water Conservation

- Analyze water usage
- Identify drips, leaks and unnecessary flows
- Operational changes
- Technology upgrades
- Invest in efficient wastewater treatment units
- Reduce use of fresh water by reusing wastewater when possible
  - Closed-loop systems
  - Condensate from equipment
  - Cooling equipment blowdown
- Incorporate use of nozzles and aerators
- Xeriscape landscaping
- Increase employee awareness
- EPA's WaterSense for commercial businesses

53,850,234.50 gallons of freshwater AND 17,862,866 gallons of wastewater were conserved in 2013 as a result of success goals developed by facilities in the P2 program.

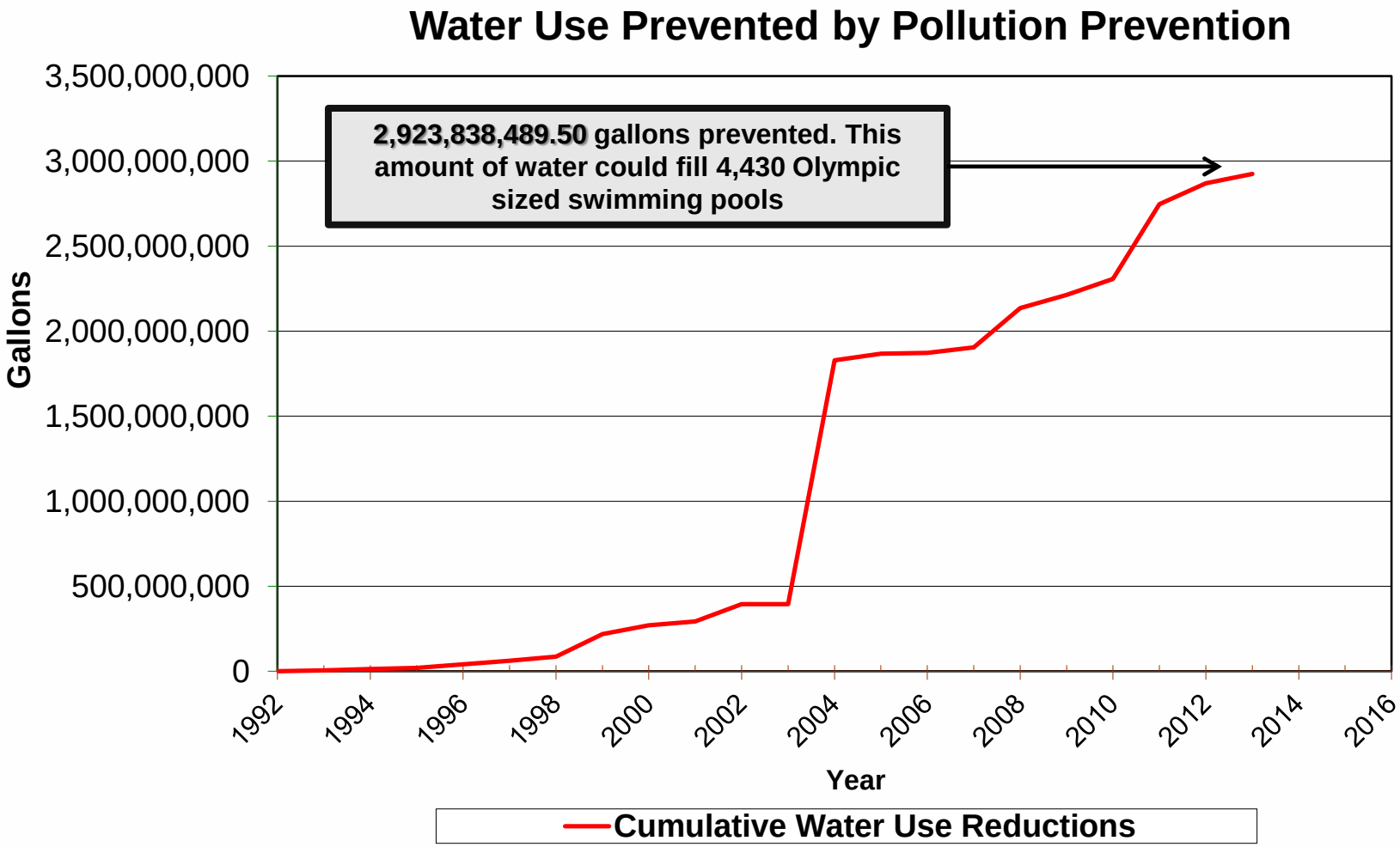
Successful water reduction examples by facilities in the P2 program

A fabricated metal product manufacturing facility was able to reduce their water usage by adjusting the timer on the sprinkler system to reduce lawn watering time by 5 minutes per sprinkler head and implemented a system to monitor and repair any leaks noted. In 2013 **506,000** gallons saved.

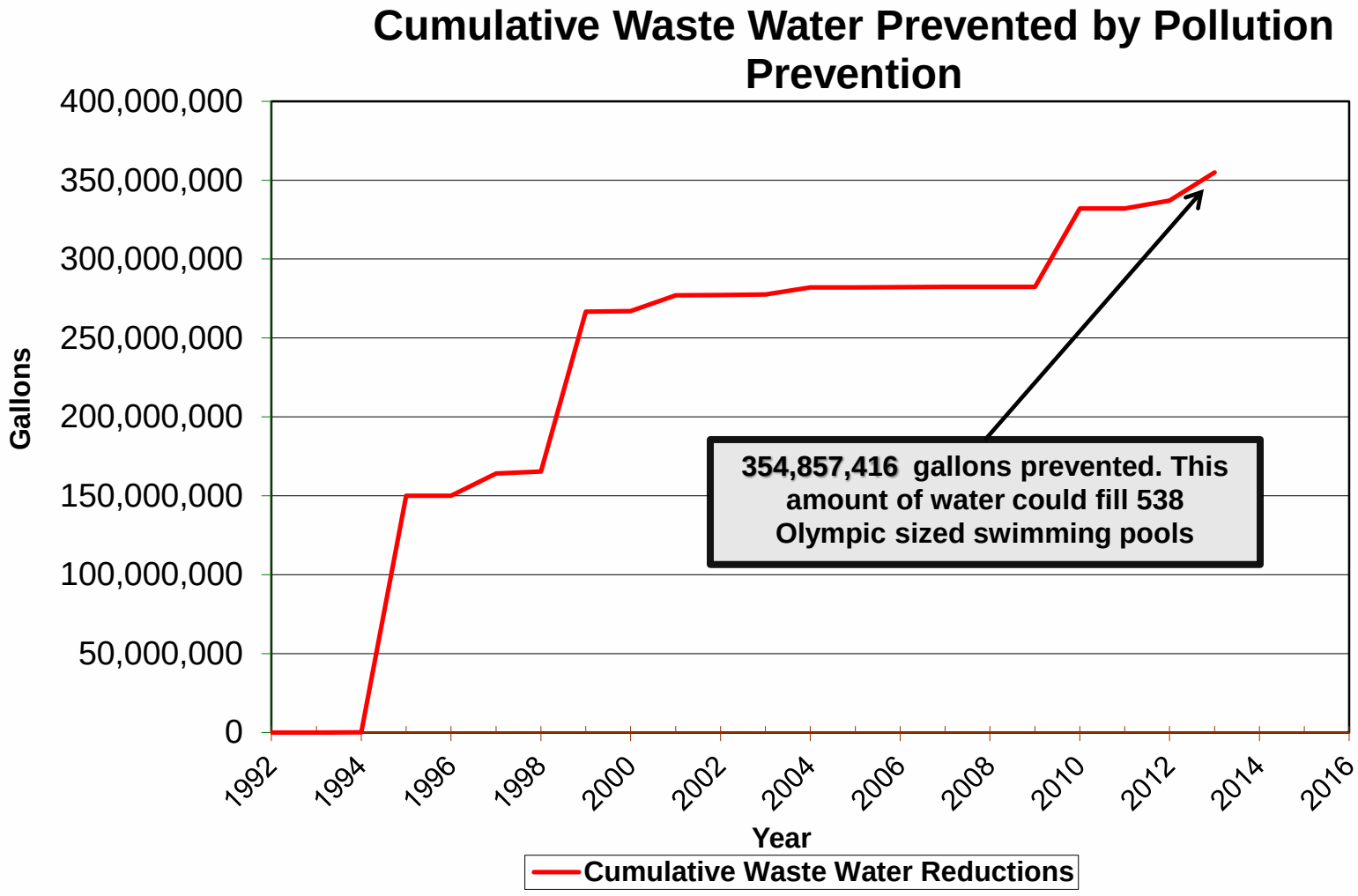
Another transportation equipment manufacturing facility was able to reduce their water usage by using water limiting fixtures and using single flush bioremediation urinals. This resulted in **389,000** gallons saved in 2013 and a cost savings of **$3,700**.

One computer and electronic manufacturing facility was able to design and implement a system to reuse process wastewater as a feed stock to cooling towers. This reduced water usage by **1,000,000** gallons during 2013.

Cumulative fresh water use conserved 1992-2013



Cumulative wastewater prevented 1992-2013



How can P2 benefit your company?

- Economic incentives
  - Reduction in disposal and treatment costs
- Liability Incentives
  - Worker safety
- Public Benefits
  - Environmentally sound company
- Human Health and Environmental Benefits

Promoting P2

- Management support
- Make sustainability a habit
- Involve workers – excellence recognition
- Minimal consumption of natural resources
- Reliance on clean, renewable energy
- Continuous improvement
- Learn about your industry and current technology
- Change the culture of the company

Questions?

Contact us! We are here to help!

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