ILLINOIS

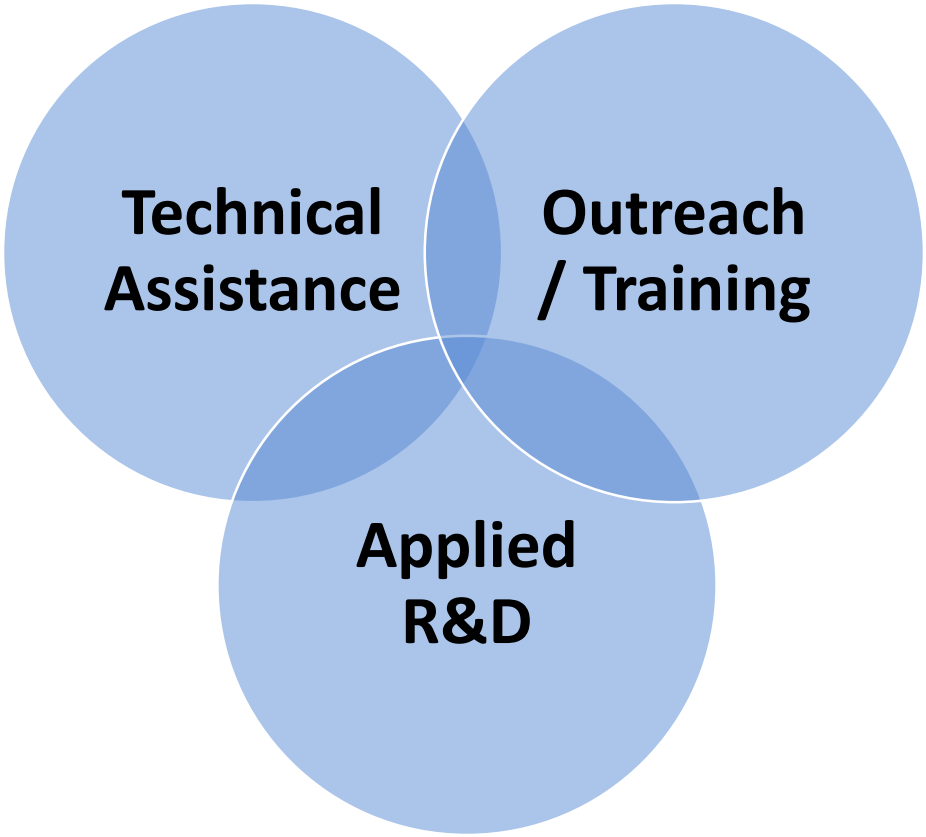
Illinois Sustainable Technology Center

PRAIRIE RESEARCH INSTITUTE

Triple Bottom Line

ISTC's Mission

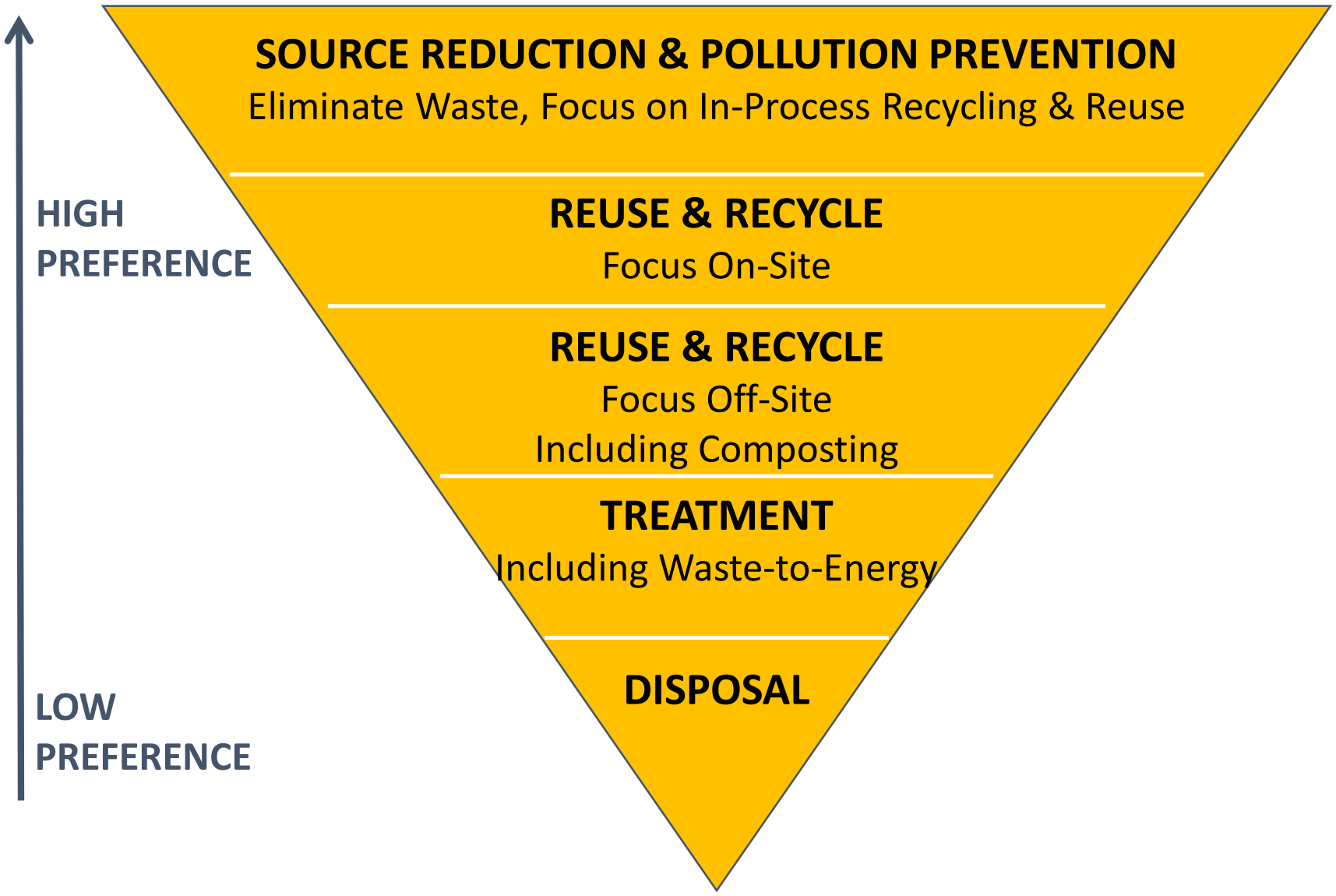
"To encourage and assist citizens, businesses and government to prevent pollution, to conserve natural resources, and to reduce waste to protect human health and the environment in Illinois and beyond."



Technical Assistance Process

- Initiate contact
- Discuss needs & concerns
- Deploy a TAP Engineer to the company
- Conduct an initial meeting & site visit
- Provide an initial recommendation report
- Establish baseline and act on next steps
- Document savings and benefits

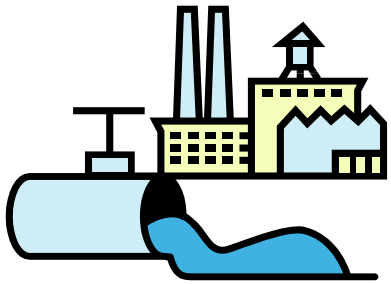
Waste Management Hierarchy



Options for Addressing Wastes

- Source Reduction
- In-process Recycling
- Clean Technology
- Raw Material Substitution
- Preventative Maintenance
- Energy Efficiency
- Out-of-process waste recycling
- Off-site waste recycling
- Last resorts:
  - End-of-pipe technologies
  - Pollution control

Technical Assistance Program Staff



Meanwhile…at the Factory

Getting In Can Be the Hardest Part

The Initial Meeting

- Introductions by Person, Phone, Email Blast, Word of Mouth, Social Media, Networking
- Who I am and What I can do for you
- What is the Client Looking to Get From You
- What are their Major Issues
  - Regulatory
  - Energy
  - Costs
  - Efficiency
  - All The Above….Sustainability
  - Remember: What is Important to You may Not be What is Important to Them

Your Take Away

- What is the Company's Project Payback Period
- Energy and Utility Bills (Spreadsheet or Actual Bills)
- Waste Bills (Solid, Hazardous, Special and Universal, Recycling…Where is this going?)
- The beginning of a Relationship

Process Flow Walkthrough

- A General Tour of the Facility
- Allows you an Overview of their Processes
- Sense of How Things Operate
- Cleanliness
- Safety Issues
- Product Movement
- Trip Hazards
- All Indicate Facility Personality

While You're Walking

Keep Your Eyes Open

Electricity E2 Lighting

Electricity E3 Compressed Air

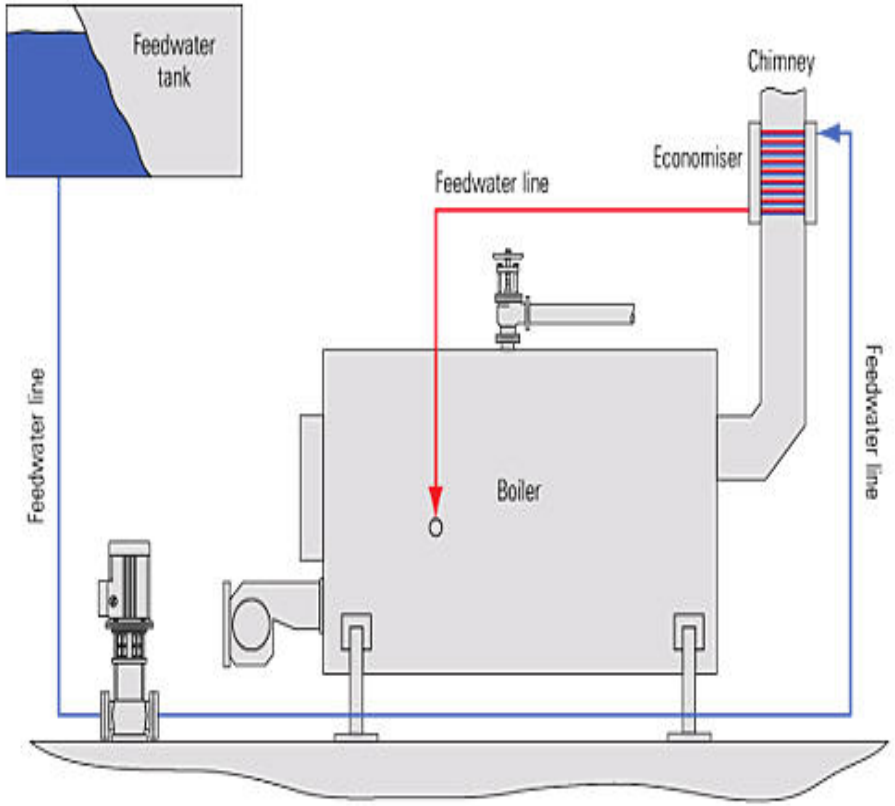
Electricity E2- Motors, Pumps and Blowers

- Install variable speed drive motors, where applicable.
- Dampers- Do you control your speed by using your brake?
- Cut motor speed by 20%, use 50% less energy.

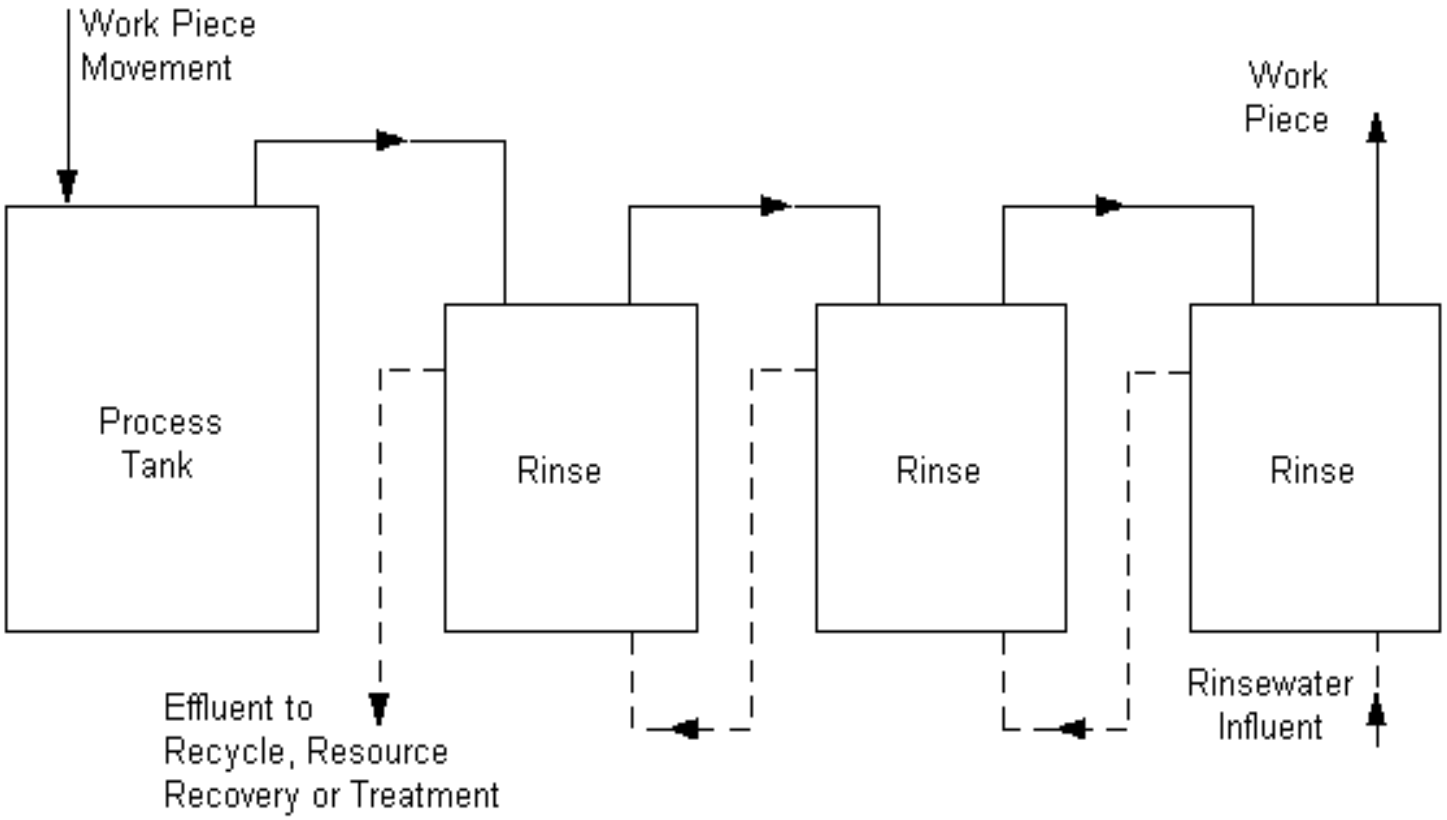
Speed	Flow	Required Power
100%	100%	100%
90%	90%	72.9%
80%	80%	51.2%
70%	70%	34.3%
60%	60%	21.6%
50%	50%	12.5%
40%	40%	6.4%
30%	30%	2.7%

Natural Gas E2- Boilers and Ovens

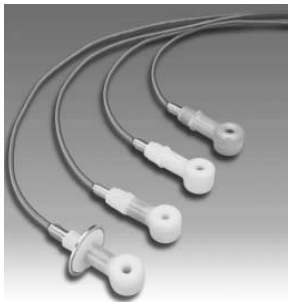
(system efficiency, design & waste energy recovery)



Counter Current Flow

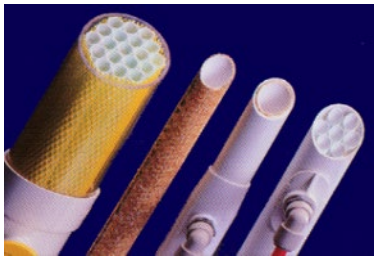


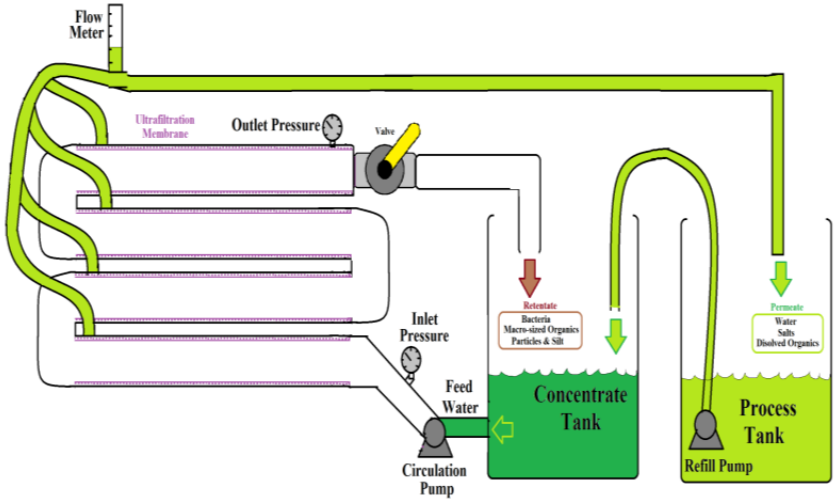
Water Conservation- Conductivity Control



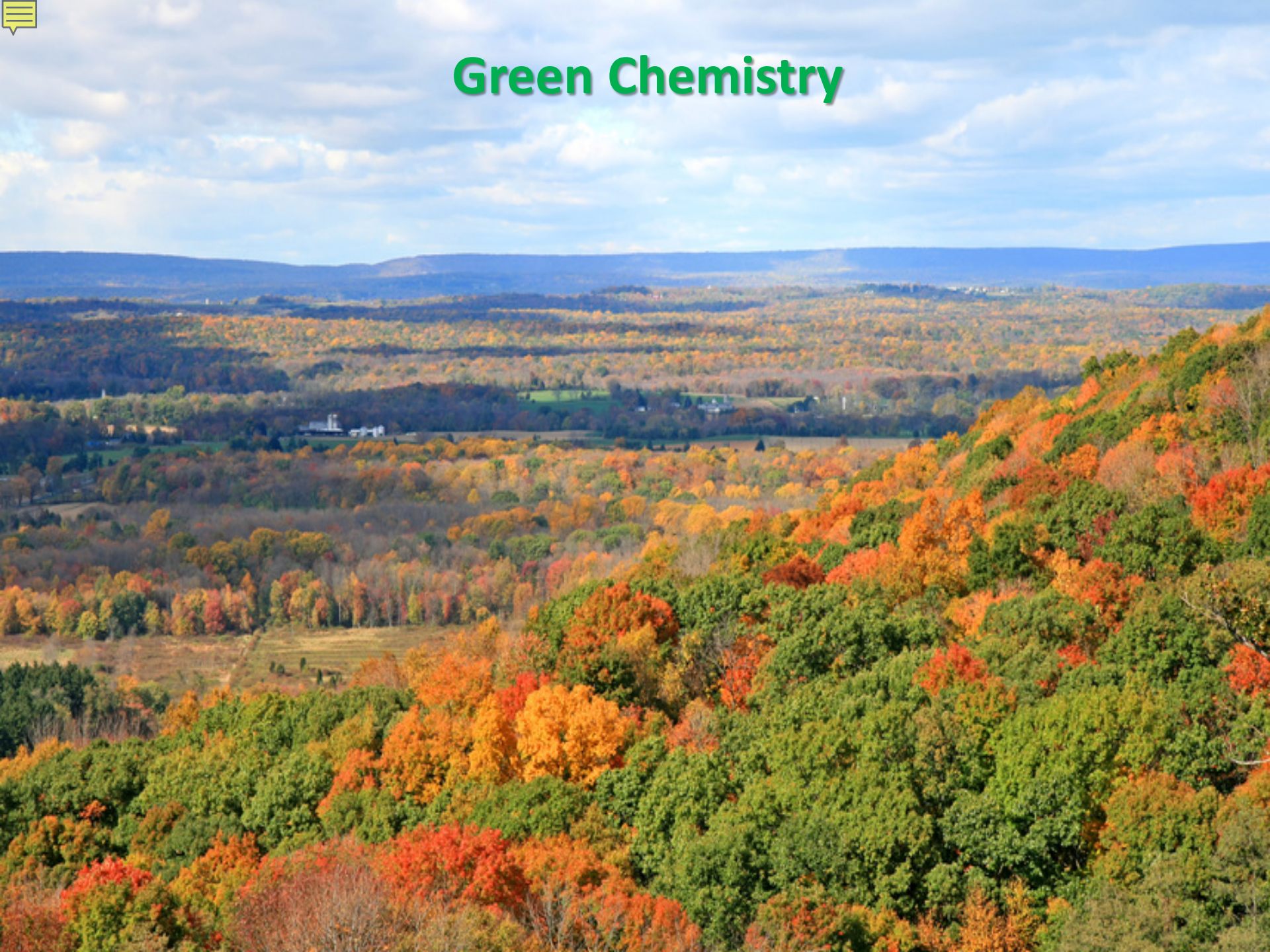
50-90% Savings

Resource Conservation- In Line Recycling
Ultrafiltration

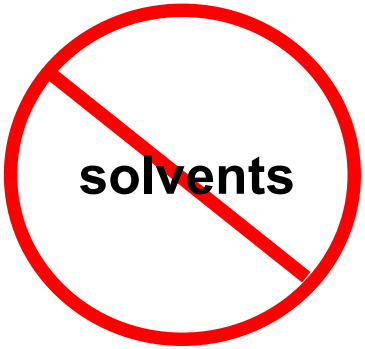




Green Chemistry



Green Chemistry



Dumpster Diving

Hazardous Material Storage

Hazardous Waste Storage

Secured with Masking Tape

Paint Gun Cleaner with no Lid

Metal Cleaning and Coating

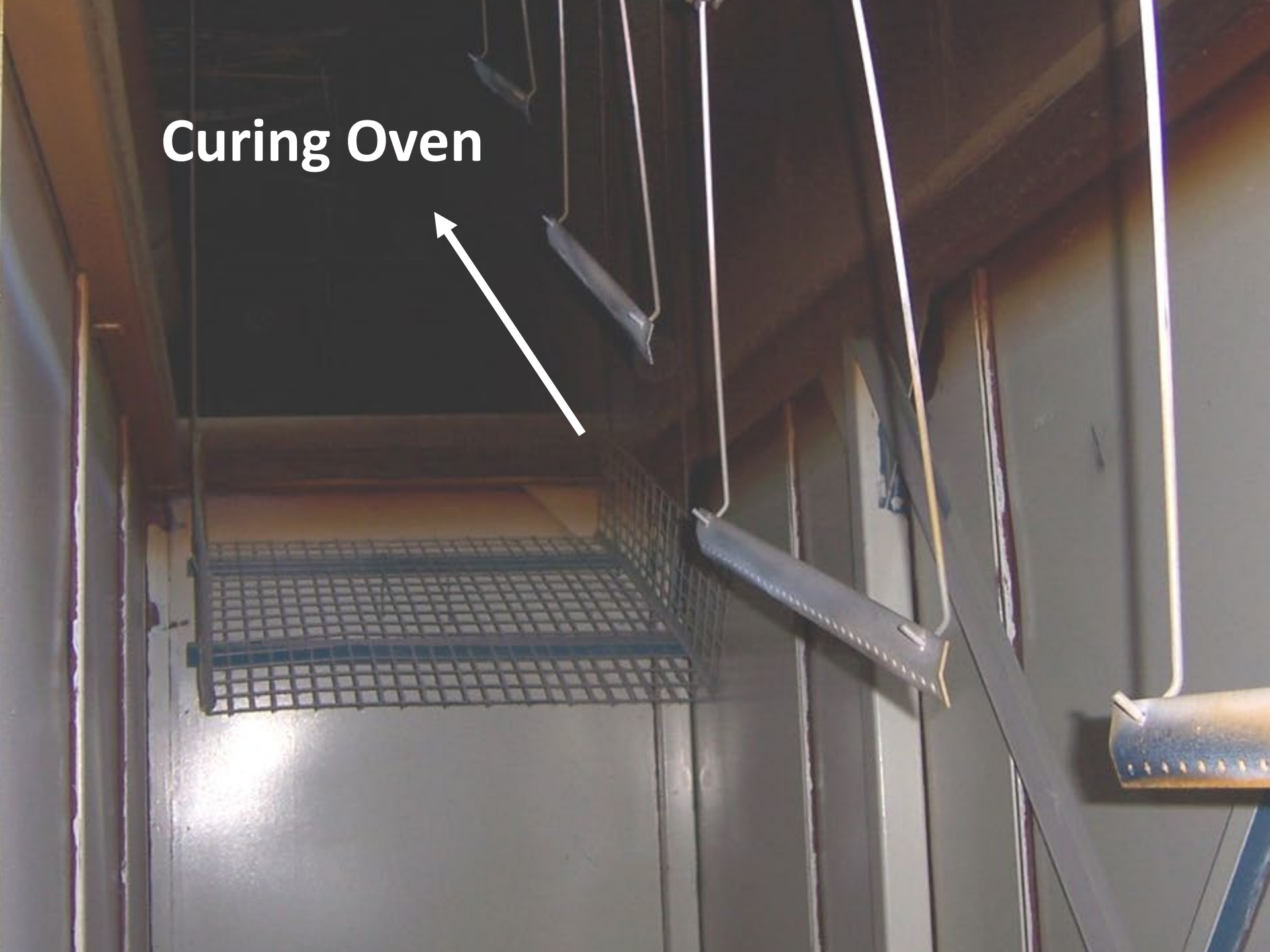
- The Following Cleaning and Coating Line Cost $0.60 per Minute in Energy


Parts Flow


Spray Wash
720 Nozzles


Dry-off Oven


Applying Powder Paint


Curing Oven

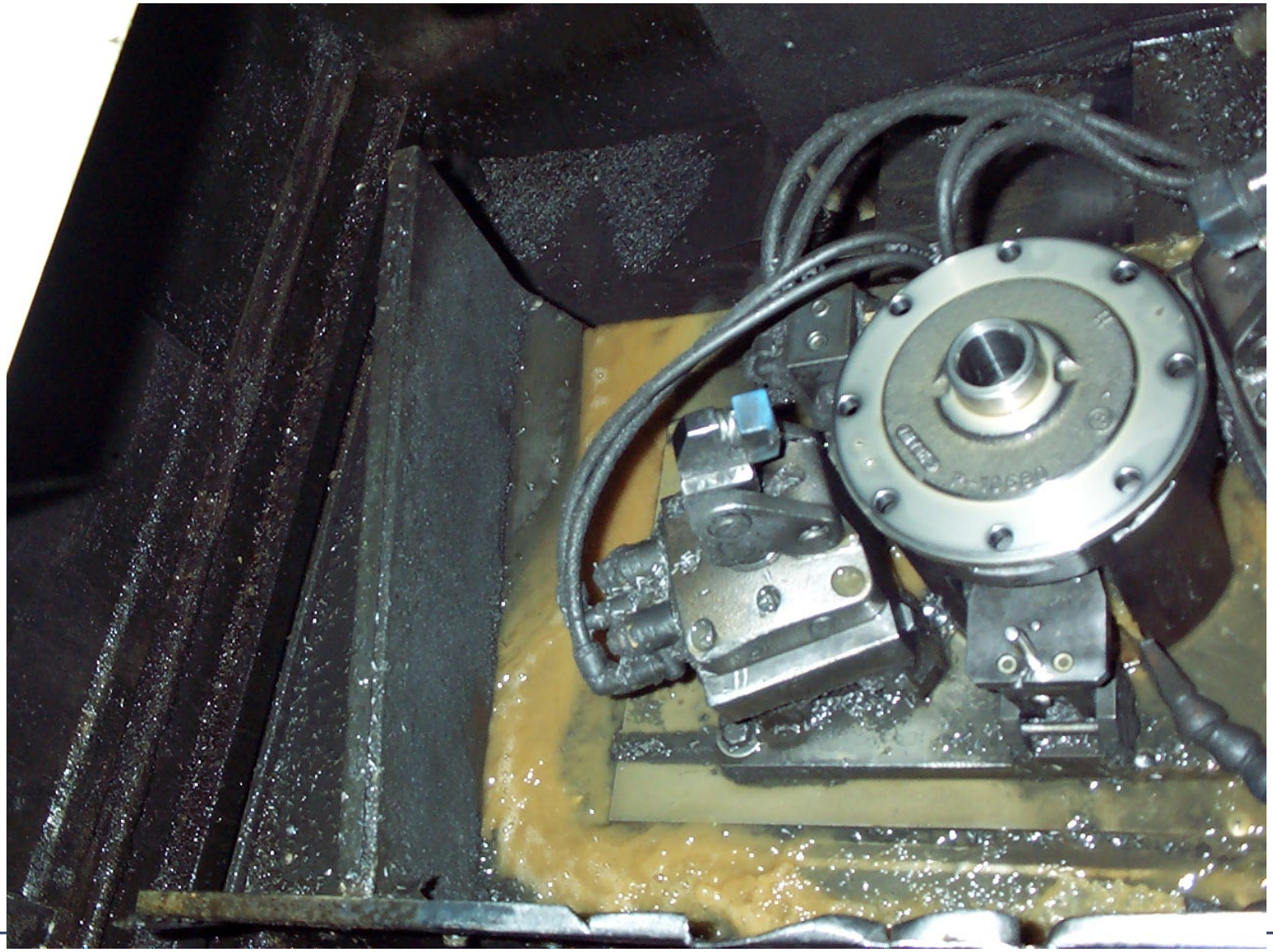
P2 Fluid Purification Unit

Before

After

Best Management Practices

Best Management Practices



Pollution Prevention

- What Point in the Projection Process is Generating the Waste?
- Can it be Reused Directly Back into the Process?
- Can it be Repurposed In-house?
- Is there a Safer Alternative?

Waste Classification

- How are They Classifying Their Waste ...Why?
- Could it be Reclassified?
  - As Universal Waste – Lamps, Batteries, Electronics
  - As Special Waste – Automotive Type Fluids
  - How are they Quantifying the Waste

How is Waste Disposed

If Animals Ran the World

Lessons Learned:

Overcoming Obstacles

P2 Truth:

Small Company Obstacles tend to be Technical

Large Company Obstacles tend to be Cultural

Lessons Learned:
Work within the Constraints - Maximize Opportunities

- Start with **no-cost, low-cost** P2E2 opportunities before high cost opportunities
  - Process changes
  - Behavioral changes
  - Low tech first…then high tech
- **Quantify** Costs and Savings (Direct and Indirect)
  - Billing, records, meters, counts, base-line measurements
  - Energy, raw materials, treatment/disposal, handling, EH&S
- Identify **external incentives** (shortens payback)
  - Utility rebates
  - Fed incentives…EPACT
  - **Database of State Incentives for Renewables and Efficiency**: **www.dsireusa.org**

Lessons Learned:
Working Smarter

- **Qualify** the client… *sales term*
  - What are the client's needs, organizational structure, culture, resources, constraints, timetable and expectations?
- Enlist **key decision-makers**
  - "Top of the food-chain," examples: CEO, GM, VP.
  - Those with influence or power, not necessarily Title.
- Develop a relationship…**TRUST**
  - Authentic, polite and personable, yet professional
  - "People really don't care how much you know. They just want to know that you care."
- **PERSISTANCE**, timing is everything…stay with it
- **A persistent, trusting relationship with the decision-maker is *critical* to the process.**

Lessons Learned:
P2 Approach

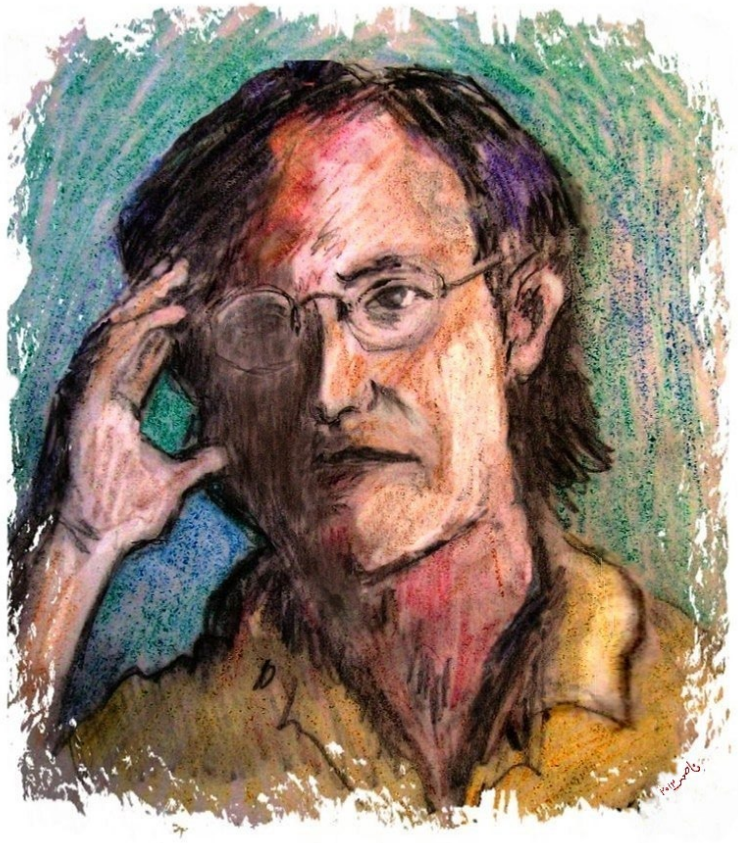
- Understand the **Process** and Identify the **Problem** **before** jumping to solutions
  - Ask Open-Ended Questions vs. “yes or no”
  - Shelve the Scripts and Checklists (*prescriptive*)…start with a blank sheet
- **Process Mapping** - map critical processes, operations or waste streams
- Utilize **Root-Cause-Analysis** to identify the source of the problem
- Identify **opportunities** and develop **solutions**

Lessons Learned:
Strategies

- Enlist a **network** of P2E2 professionals
  - Stakeholders: Government, private, NPF
- Bring **technologies to the business**
  - On-site demonstrations and pilots (ADOP2T)
  - Increases adoption through showing:
    - Advantages, Compatibility, Complexity, Observability Trialability
- Establish **mentor facilities** of P2 technologies
- Progress from identifying opportunities to **execution** and **implementation**

Special Thanks to:

The Far Side….For Brightening My World and Presentation



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Questions?

THANK YOU

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