

P2 For DEC P2 Staff

WORKSHOP

New York State Pollution Prevention Institute

Albany, NY

November 25, 2008

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Agenda

- 9:00-10:30 Introductions and Basic Concepts (P2 concepts, P2 and Sustainability); Role of the Agency P2 Staff
- 10:30-10:45 BREAK
- 10:45-11:30 Making the Business Case for P2 (including metrics)
- 11:30-12:30 Identifying, Evaluating, Characterizing Opportunities
- 12:30-1:30 LUNCH
- 1:30-2:00 Identifying, Evaluating, Characterizing Opps (cont.)
- 2:00-3:00 P2 In Action- Case Study
- 3:00-3:15 BREAK
- 3:15-3:45 Available Tools and Resources, NYSP2I Overview
- 3:45-4:00 Q&A and Closing Remarks
- 4:00 Adjourn

P2 and Sustainability

- P2 has evolved over time
- Early on interchangeable with pollution control
- Now more aligned with sustainability and sustainable practices
- Product stewardship, life cycle concepts, innovation technology, design considerations

Sustainability

- A balance of environment, economy, quality of life/lifestyles
- Long term (“sustainable”)
- Considers life cycle implications
- Considers the consumption side

The Cold, Hard Facts

- Cannot “regulate” sustainable behavior- people will bail out at first opportunity
- Must be practical and realistic- “cannot have your cake and eat it too.”
- Everyone has to give a little
- Ecosystems and markets do not recognize national or political borders

P2 Concepts

- Basic Definitions
 - What do we mean by “pollution”?
 - Uncontrolled adverse impact to environment vs. inefficient use of resources which in turn generates waste (“adverse impact” vs. “waste”)
- P2 vs. End of pipe solutions
 - Where do you start? Reducing waste from being landfilled vs. reducing waste from being generated

Environmental Policy- The Early Days

- Reacting to growing public outcry and awareness
- Strong role for government; birth of EPA
- Protective and remediation; correcting the effects of past practices. Setting in place legislative and regulatory infrastructure
- Strong emphasis on oversight, enforcement
- Relatively focused on domestic issues

The 1980's

- Policy now focusing on managing current activities.
- New laws and regulations on waste management and industrial operations
- Beginning of policies that required public awareness. The public needs to know the risk.
- Renewal of early legislation
- Stronger role of state governments

The 1990's

- More proactive thinking
- Pollution Prevention and Waste Prevention/Minimization
- Beginning to see voluntary programs
- Significant growth in role of states
- Although still strongly driven by regulation, a growing role for the private sector

Environmental Policy Today

- Expanded scope- as big as global issues but recognition of grassroots value.
- Recognize that environmental policy affects the global ecosystem AND the global economy
- Much stronger influence of economic forces
- Bigger role for the private sector
- Partnerships between the private and public sector
- Reward good performance

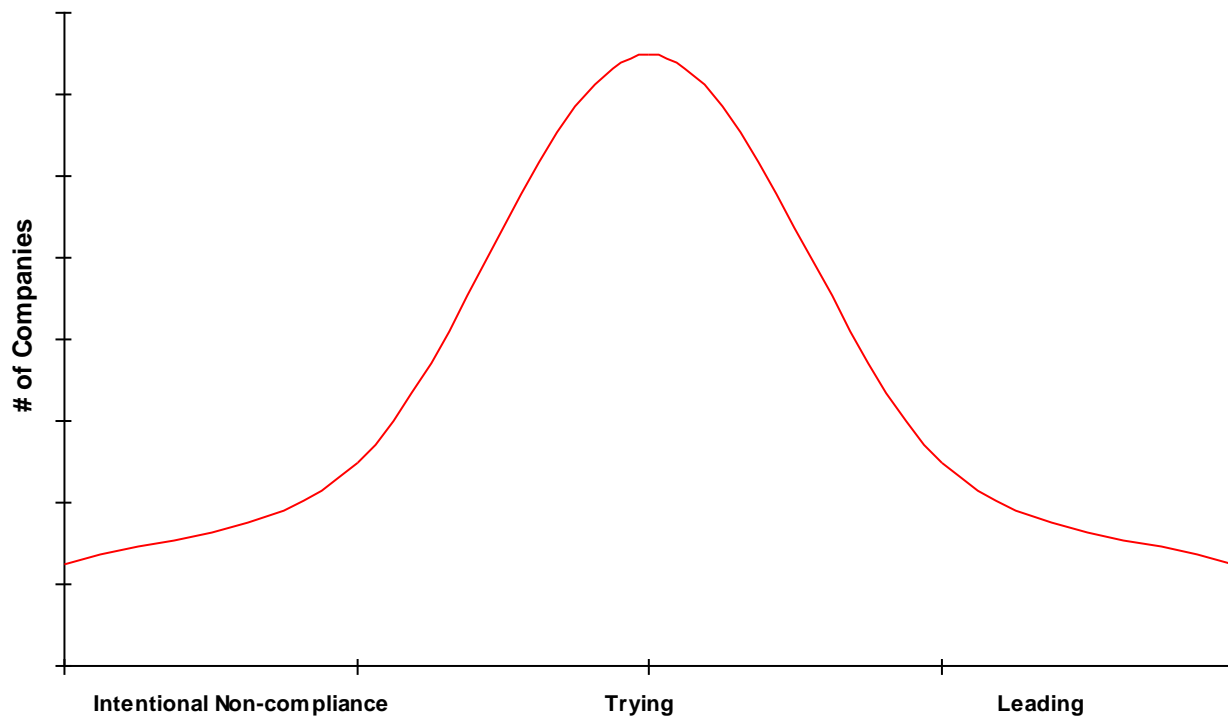
And on the Regulatory side...

- Less regulation, more incentives
- More flexibility in meeting requirements
- Incentives to go beyond basic requirements
- Even enforcement and penalties reflect commitment to improvement and be less punitive
- Cooperative Conservation- policy making in partnership

The Landscape-2008

- Cooperative Conservation
- Private-public Partnerships
- Voluntary Initiatives
- “Market Forces” as an Agent of Change
- Performance, Accountability, Measurement, and Reporting

Compliance Distribution



Role of the NYSDEC P2 Staff

- Excellent opportunity to identify and share P2 ideas
- All DEC players should be aware of P2 (inspectors, enforcement, permitting, R&D, rulemaking, special and voluntary programs)
- Need to recognize, support and promote incentives and value to companies

Making the Business Case for P2

Making the Business Case for P2

- Difficult to regulate under current legal and regulatory structure
- Many P2 decisions are actually more attractive for economic reasons
- Recognizing payback time period concept (could cost more upfront, but in the long run, less costs)
- P2 value **MUST** be expressed as both environmentally **AND** economically viable

How Can You be “Excused”?

- You generate no waste, use no raw materials or resources, consume no energy
- So practically speaking- no one is exempt from benefiting through sustainable practices
- Law of physics- conservation of matter and energy; “waste is something you paid for but did not use”

Key Factors for Success

- Leadership support (get it and keep it)
- Making the business case
- Effective deployment (standards)
- Fully engaging all key players
- Good mix of technology, practices, and awareness
- Choosing the right metrics and effective measurement
- Clear and concise reporting
- Acting on results

A Word About Metrics

- Must be relevant
- Must be practical and measureable
- Must tie to the goals
- Ideally, can be aggregated
- Ideally, are comparable to benchmarks
- For reporting, need to be something to which the reader can relate

Identifying, Evaluating, and Characterizing Opportunities

Sustainable Practices- What can I actually do?

- Energy Efficiency-Buildings
- Energy Efficiency- operations
- Renewable energy
- Procurement
- Electronics
- Toxics Reduction/Waste Minimization
- Recycling
- Fleets and Fuel
- Work force efforts

Identifying P2 Opportunities

- P2 Opportunities need to be identified:
 - Data collection
 - Interviewing- what to ask
 - Site reconnaissance- what to do look for

Evaluating Opportunities

- Synthesizing and processing the collected information
- Characterizing the opportunities
 - Environmental/energy benefits
 - Economic benefits

Types of Opportunities

- Technological
- Process improvement
- Human Resources (training, awareness, competence)
- Operational improvement

Going About the Process

- Engage all affected players
- Identify your basic footprint- baseline
- Start to develop goals in line with what you found out about your footprint
- Do a reality check of goals- the business case
- Develop a prioritized timeline- be realistic but ambitious
- Begin to implement
- Measure and adjust
- Report
- Continue to improve

Environmental Management Systems and P2

EMS in Practice

- An Environmental Management system is the management approach to determining, prioritizing, implementing, and improving upon those environmental issues that will lead to sustainable environmental stewardship.
- EMS (ISO 14001) provide a structure, not prescriptive performance goals
- P2 is inherent to EMS because EMS goes beyond compliance only but needs organizational goals

Using EMS as the Framework for Sustainability

- Health & Safety
- Compliance
- Security
- Energy
- NEPA (and Adaptive Management)
- Green Buildings
- Green Purchasing
- P2, Waste Prevention, and Recycling
- Electronics Stewardship
- Real Property Management

Lean Energy & Environment (LE2) Case Study

Lean, Energy, and Environment (LE2)

- Merging of Two Separate Programs Developed by EPA
 - Lean and Environment Program
 - Lean and Energy Program
- See EPA's website for Program Toolkits
 - <http://www.epa.gov/lean/>



The Lean and Environment Toolkit



The Lean and Energy Toolkit



Lean, Energy, and Environment

- Lean and Environment
 - offers practical strategies and techniques to Lean implementers about how to improve Lean results while achieving environmental performance goals
- Lean and Energy
 - offers practical strategies and techniques to Lean implementers about how to improve Lean results while reducing energy use, costs, and risk

Benefits of Combining Lean & E2

“Lean” Eliminates...

- **D**efects
- **O**verproduction
- **W**aiting
- **N**on-utilized resources
- **T**ransportation
- **I**nventory
- **M**otion
- **E**xtra processing

“E2” adds...

- **F**ull use of Raw Material
- **E**nergy Efficiency
- **W**ater conservation
- **E**liminating Toxic Material
- **R**eduction of:
 - Packaging Wastes
 - Emissions to Air and Water
 - Solid & Hazardous Wastes
 - Regulatory obligations and risks



LE2 Case Study – Tecmotiv

- Upstate New York Remanufacturing business
- In business more than 50 years
- Rebuild & fabricate engine parts for military tanks and armored personnel vehicles
- Focus: Cylinder process

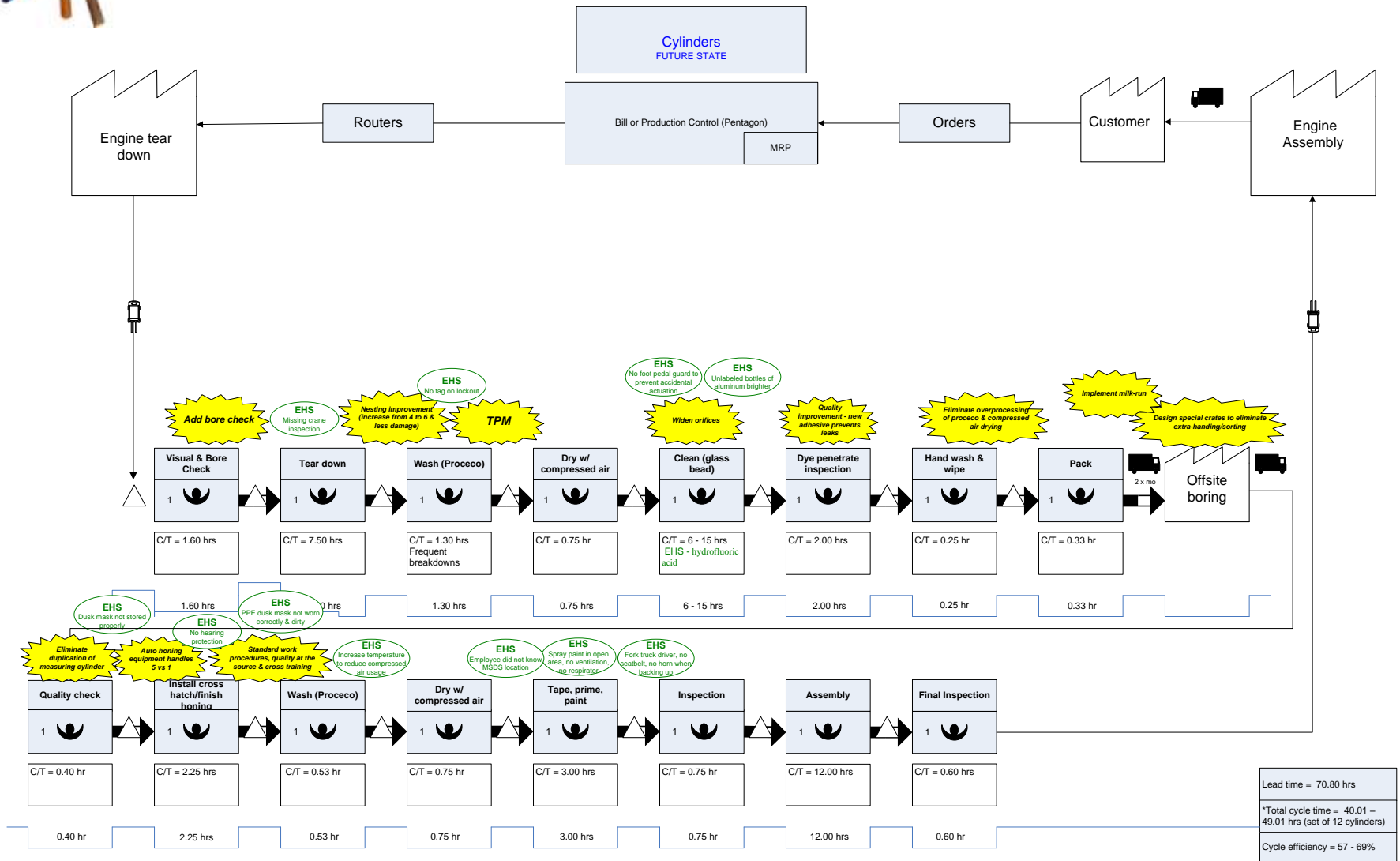


Integrating Environment and Energy into Lean

- Assess each process for environmental wastes and EHS improvement opportunities
- Look for processes...
 - with high energy, water, and material use
 - with significant solid or hazardous waste generation
 - requiring environmental permits or reporting to environmental agencies
 - with pollution control equipment
 - using toxic chemicals that require personal protective equipment (PPE)



Future State Value Stream Map - LE2



Specific Improvements – Power

- Electricity use reduced due to less usage of Proceco high-pressure spray washer
- Electricity use reduced to less usage of abrasive blast cabinets
- Electricity use also reduced due to less rework
- Electricity savings calculated using proprietary spreadsheet software, and compressible flow equations

Specific Improvements – Detergent

- Detergent use reduced due to less usage of Proceco high-pressure spray washer
- Detergent use also reduced due to less rework
- Detergent savings calculated using proprietary spreadsheet software

Specific Improvements – Water

- Water use reduced due to less usage of Proceco high-pressure spray washer
- Water use also reduced due to less rework
- Water savings calculated using proprietary spreadsheet software and experience from observation of water use

Specific Improvements – Non-Hazardous Wastewater

- Wastewater reduced due to less usage of Proceco high-pressure spray washer
- Wastewater also reduced due to less rework
- Wastewater flow rate calculated using proprietary spreadsheet software and mass balance analysis

Specific Improvements – Glass Bead

- Glass bead use reduced to less usage of abrasive blast cabinets
- Glass bead use also reduced due to less rework
- Glass bead savings calculated using purchasing records

Specific Improvements – Non-Hazardous Solid Waste

- Non-hazardous solid waste reduced to less usage of abrasive blast cabinets
- Non-hazardous solid waste also reduced due to less rework
- Non-hazardous solid waste reduction calculated using purchasing records and mass balance analysis

... additional E2 improvements & savings

- Lower regulatory non-compliance risk
- Improve environment quality
- Reduce exposure to toxic substances
 - Still need to eliminate use of HF
- Improve employee morale and commitment
 - Cross-training
 - Assemblers now responsible for quality
 - Posted work instructions

Annual Savings from LE2 Implementation

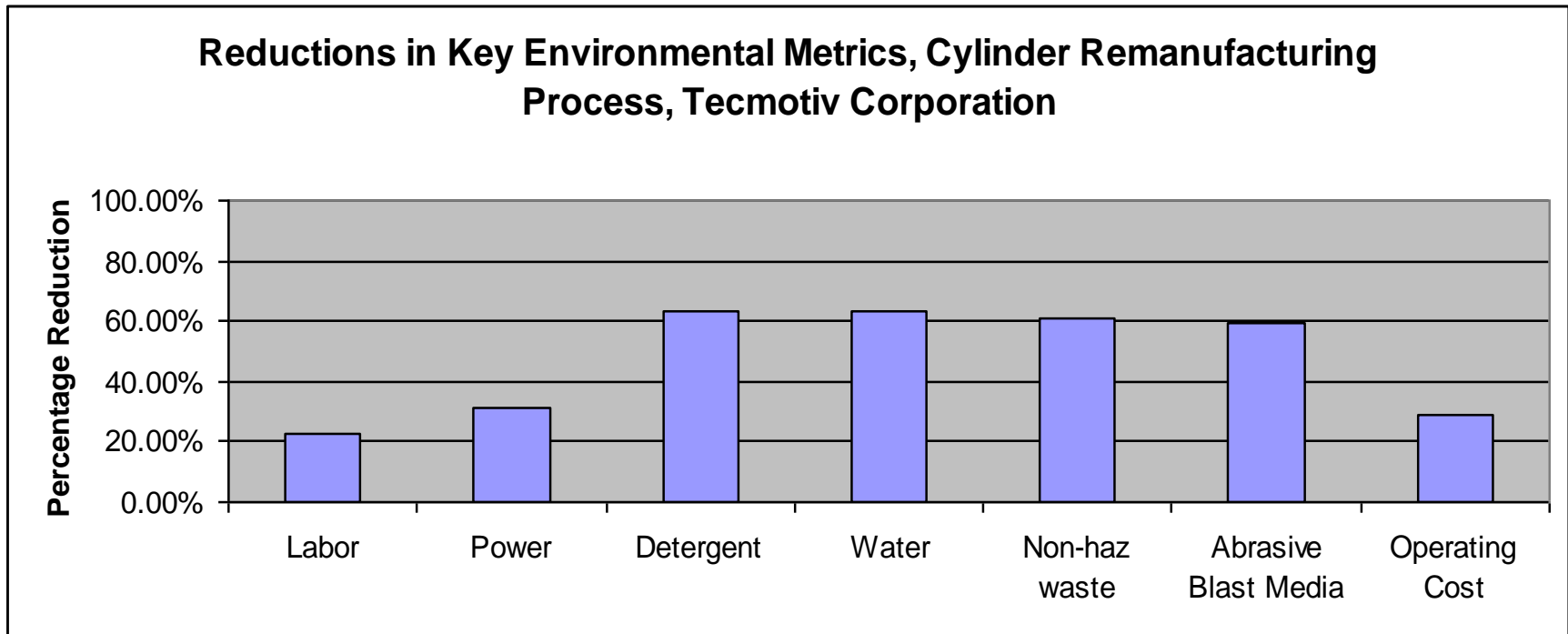
(cylinder remanufacturing
only)

- Operating cost: \$64,335
- Power: 32,709 KWH
- Detergent: 41 gallons
- Water: 1,480 gallons
- Glass bead: 3,631 pounds
- Non-hazardous wastewater: 259 gallons
- Non-hazardous solid waste: 5,791 pounds



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Results from LE2 Assessment – Tecmotiv Corporation



Resources, Tools, and the NYSP2I

Available P2 Resources

- Assessment Tools
 - High level, exploratory
 - More rigorous characterization
 - LE2 (Lean, Environment, Energy)
- Benchmarking Tools
 - Measuring P2 impacts
- Best Practices
- Case Studies
- Standards

Available P2 Resources

- NYSDEC
- EPA
- NYSP2I
- P2Rx
- Company Case Studies
- Environmental Award Programs

Using Standards

- International consensus standards serve as an excellent tool for sustainability because:
 - Global
 - Market-driven
 - Developed by key stakeholders
 - Transparent

Standards

- Management Systems (14001, 9001, 18001, 20001, 50001)
- Supporting Management Systems: Life cycle assessment, environmental performance evaluation, labeling, environmental communication
- Climate: Greenhouse gas inventorying and reporting (ISO, GRI, DOE, EPA)
- Green buildings (LEED, Green Globe)
- Electronics (EPEAT)
- Products (Green Seal, etc)
- Energy (Energy Star, Plant Certification)

NYSP2I

Vision:

The vision for the NYS P2I is to foster the transformation and development of sustainable businesses and organizations in New York State in a collaborative program committed to making the State a leader in environmental stewardship.

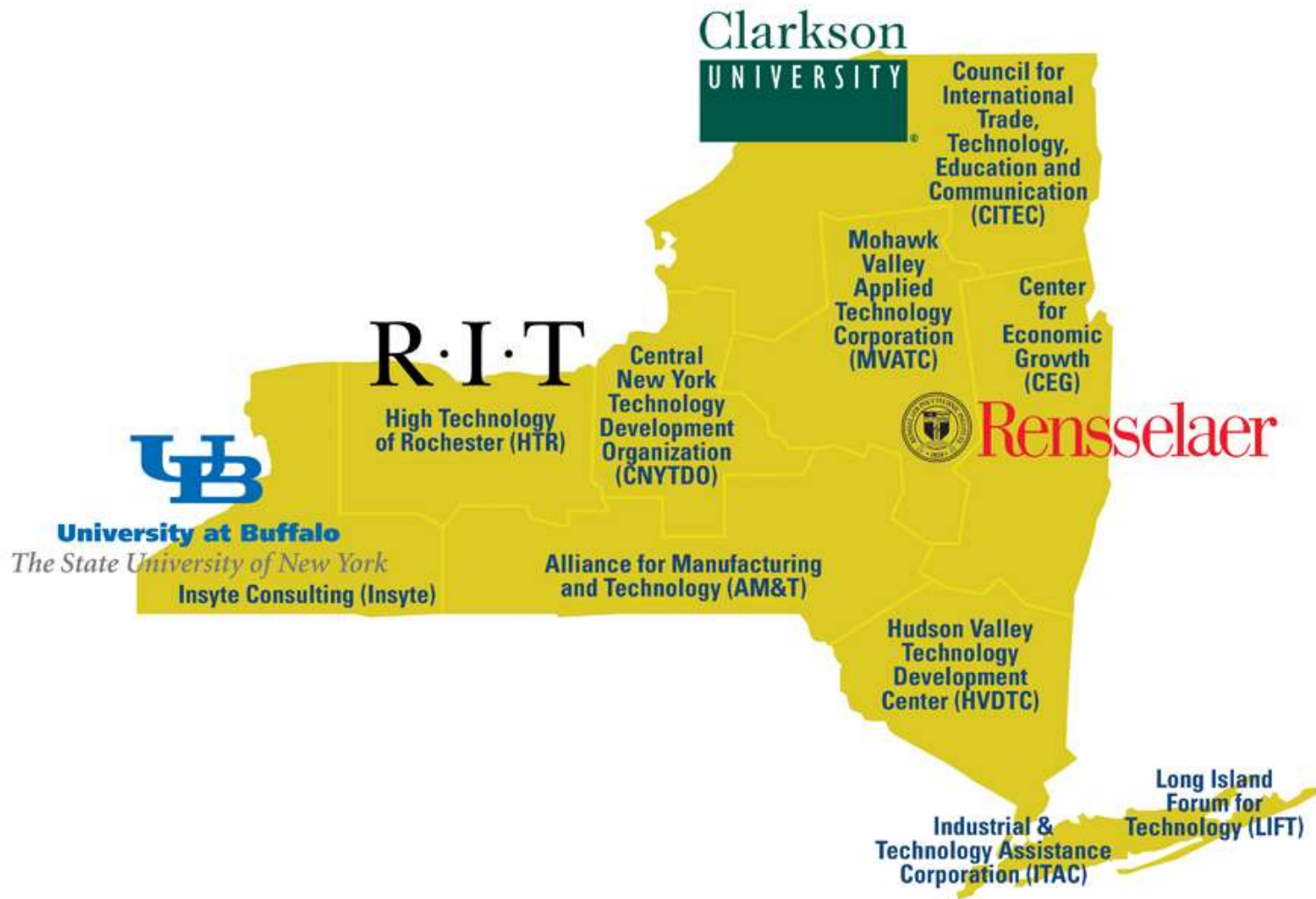
NYSP2I

Mission:

The mission of the NYS P2I is to provide a state-wide, comprehensive and integrated program of technology research, development and diffusion, outreach, with training and education aimed at making New York State more sustainable for workers, the public, the environment and the economy through:

- reductions in toxic chemical use;
- reductions in emissions to the environment and waste generation; and
- the efficient use of raw materials, energy and water.

NYS Pollution Prevention Institute



What is Available

- *Solving Problems*: Targeted Research, Development, and Diffusion
- *Sharing Knowledge*: Awareness, Training and Education
- *Sharing Information*: Information Exchange and Outreach (nysp2i.rit.edu)
- *One-on-One Help*: Hands on Direct Assistance
- *Helping Communities*: Community Grants Program

NYSP2I Customers

- Industry / manufacturing
- Commercial organizations
- Community organizations
- Public sector entities
- Non-profits
- Educational facilities and schools

Community Grants Program (CGP)

- Goal of the Community Grants Program
 - to provide financial and technical support to community organizations and municipalities to conduct projects that:
 - raise awareness and understanding of P2
 - lead to implementation of P2 efforts at the local level with the goal of improving the health, environmental quality and economic vitality of New York State communities.

The NYSP2I and the Green Economy

- Helps businesses succeed by being more environmentally sound, cost effective, and energy efficient.
- Allows companies to market this effort
- Promotes green jobs and green products

Contacting the NYSP2I

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