Illinois Sustainable Technology Center

The Cutting Edge Partnership
The Cutting Edge Partnership

- Focus upon Reducing the Environmental Footprint of Metalworking Fluids (MWF)
- ISTC and IEPA OPP partnering with manufacturers and vendors
- Promote pollution prevention (P2) and energy efficiency (E2) at facilities using MWF
The Cutting Edge Partnership

- Multi-media: source reduction, green chemistry, chemical management, substitution, process efficiency, in-line recycling, extending MWF life and BMP

- Demonstrate measurable environmental results

- Funded by EPA Region V
Supporting USEPA Region V Goals

- Reduce pollution
- Conserve natural resources
- Improve environmental stewardship practices
What is MWF and Its Use?

- Synonymous with “coolant”
- Lubricates the cutting tool and the workpiece
- Reduces friction, preventing burning & smoking
- Dissipates heat
What is MWF and Its Use?

- Transports metal chips away
- Improves product quality and extends tool life
- May be a straight oil or a solution containing an oil or synthetic dispersed in water
Why Metalworking Fluids?

- MWF are difficult to treat
- Impose a significant burden on the environment if inadequately treated
- Present unique personal health and safety issues
Reducing the Environmental Footprint of Metalworking Fluids

The Bottom Line

- Reduce the amount of MWF used and/or disposed
- Extend the useful life of the MWF and/or tooling
- Conserve natural resources: water, chemicals, energy, etc.
- Reduce the cost of “Doing Business”
Technical Assistance Protocol

- Cost of MWF: usage, management and disposal
- Tooling expenditure - direct correlation w/ MWF
- Energy consumption & costs - electricity and gas
- Conservation - water, compressed air, raw materials, etc
- Solid waste - source reduction, reuse or recycle
- Recommendations and opportunities for improvement
Technical Assistance Protocol (cont’d)

- Creation of a detailed, confidential on-site assessment report
- Active discussion of the assessment report with client in person
- Client prioritizes the recommendations
- A program is tailored: information, mentorship(s), on-site assistance, demonstrations, and/or pilot projects
- Change agents through the process
Technical Assistance Protocol (cont’d)

- Development of a trust relationship between ISTC and the client
- Acceptance of technology(ies)
- Accelerated diffusion (ADOP2T)
- Ultimately: reduced costs of the client
- Reduced footprint and impact upon the environments
Demographics and Project Outputs

- 50 candidates within the selected geographic area: Central Illinois
- Small to medium size
- 16 assessments conducted
- 13 Facilities
- 130 Technical assistance visits
Project Output Measurements
To Date

5 Full participating MWF partners
8 Non-participating partners
222 Recommendations Identified
96 Recommendations Implemented
(43 %)
Project Output Measurements
To Date

41 Pilot projects recommended

39 Pilot projects tested

26 Pilot projects implemented (63%)

5 Project tools developed

3 Case studies developed
Recommendations

- Energy Efficient Lighting Upgrade
- Air Compressor Systems
- MWF Reclamation
- MWF Selection
- Solid Waste
- Best Management Practices
Energy Efficient Lighting
Air Compressor Systems
MWF Reclamation UF System
MWF Fluid Purification Unit
Before Fluid Purification Unit
After Fluid Purification Unit
Best Management Practices
Conductivity Control
Annual Environmental Outcomes

MWF

MWF Conserved, not Disposed: 125,575 Gallons

Water Conserved: 229,570 Gallons

Savings: $488,050
Annual Environmental Outcomes
Energy

Savings Identified: $532,767

kWh Saved: 8,311,230

BTU Saved: 28,359,092,632

Pounds CO2 Eliminated: 7,878,898
Questions?