



Pollution Prevention— Learning as we go

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helping businesses
reduce waste and
maximize efficiency

Topics Covered

- MnTAP background and evolution
- Examples and case studies
- Success factors
- Lessons learned



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MnTAP Overview

- Funded by the Minnesota Pollution Control Agency
- Enabling legislation: Waste Management Act, MN Toxic P2 Act
- Located at the University of Minnesota, School of Public Health
- Annual budget: \$950,000
- Staffing: 11 staff



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Type of Assistance

- Focus on pollution prevention, or reducing waste at the source
- P2 assistance through procedures, process, and product changes
- Integrating energy efficiency
- Technology diffusion model: industry feedback, technology demos, pilots
- Referrals to the “assistance network”
- Cost-first approaches



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MnTAP Services (annual goals)

- Telephone assistance (1,000)
- Site visits (150)
- Student interns (6-8)
- Materials exchange (515)
- Presentations and seminars (50)
- Information resources



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MnTAP—the early years

- 1984
 - Moratorium on HW siting process in MN
 - Amendments to the MN Waste Management Act designating waste reduction at the “top of the hierarchy”
- 1985
 - Establishment of MnTAP at the University of Minnesota—focus on waste reduction, single media, and small business
 - Student intern program established



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Student Intern Program

- Over 20 years
 - 114 student projects in companies
 - Reduced 108 million lb waste and emissions
 - Saved companies \$5 million



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Student Intern—Hibbing Taconite

- Iron ore pellet producer for the steel industry
- Reduction: 15,000 tons of waste at nine mills due to ore spillage
- Savings: \$250,000/yr in recovered ore material



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6/11/2001

The 1990s

- Passage of the MN Toxic Pollution Prevention Act—more resources; more responsibilities; multimedia; includes P2 planning
- Used Clean Air Act as impetus for companies to implement P2
- Established a partnership with the Small Business Assistance Program (SBAP)



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P2 Planning/Progress Reports

Benchmark Electronics, Albert Lea, MN

- Solder (Pb) dross reduction—30%
 - Turn pumps off during weekends
 - Nitrogen inerted waves
- Solder paste reduction
 - Use cartridges instead of jars
 - Refrigerate paste



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SBAP Partnership

- Dry cleaning
- Fiber reinforced plastics
- Wood finishing
- Chrome plating
- Vapor degreasing



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1995

- Began to document impacts on waste/emissions reduced and cost savings to businesses
- Established materials exchange: reuse can lead to source reduction (foot in door)



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Water Use and Sewer Access Charges (SAC)—Technical Plating

- Metal finisher serving the electronics, medical and general manufacturing industries
- Reduction: 2.6 million gallons water by improved flow control and effluent reuse
- Savings: \$7,100/yr plus one time SAC (metro) fee of \$44,100



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Materials Exchange

Benny Machine and Andrews Knitting Mill

- Machine shop uses cardboard tubes from mill for packaging parts
- Saved \$2,820/yr in shipping costs and reduced the number of damaged parts



2000—The New Millennium

- Established partnership with POTWs to reduce industrial loading



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POTW Load Reduction Program

- Motivators
 - Phosphorus strategy in MN
 - Phosphorus Management Plans
 - Phosphorus limit of 1 mg/L
- Partners
 - MN Pollution Control Agency
 - MN Wastewater Operators Association
 - McKnight Foundation
 - Cities



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POTW Load Reduction Results

Worked with over 140 communities and 115 industries, conducted 62 site visits, had 7 intern projects, and 8 P2 teams

- Reduced 66,000 lb of phosphorus and 7.5 million lb BOD/TSS; conserved 103 gallons water; saved companies \$3.2 million



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2002-2004

- Began to address energy efficiency—foot in the door and met company needs
- Began technology diffusion efforts to improve implementation rate



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Energy Efficiency

Mulroy's Auto Body

- Installed process control to put paint booth into “sleep mode” when spray gun was not in use
- Xcel Energy provided a custom rebate for \$10,000 due to energy savings



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Technology Diffusion Efforts

- Industry sectors
 - Fiber reinforced plastics
 - Wood finishing
 - Metal finishing
 - Metal casting

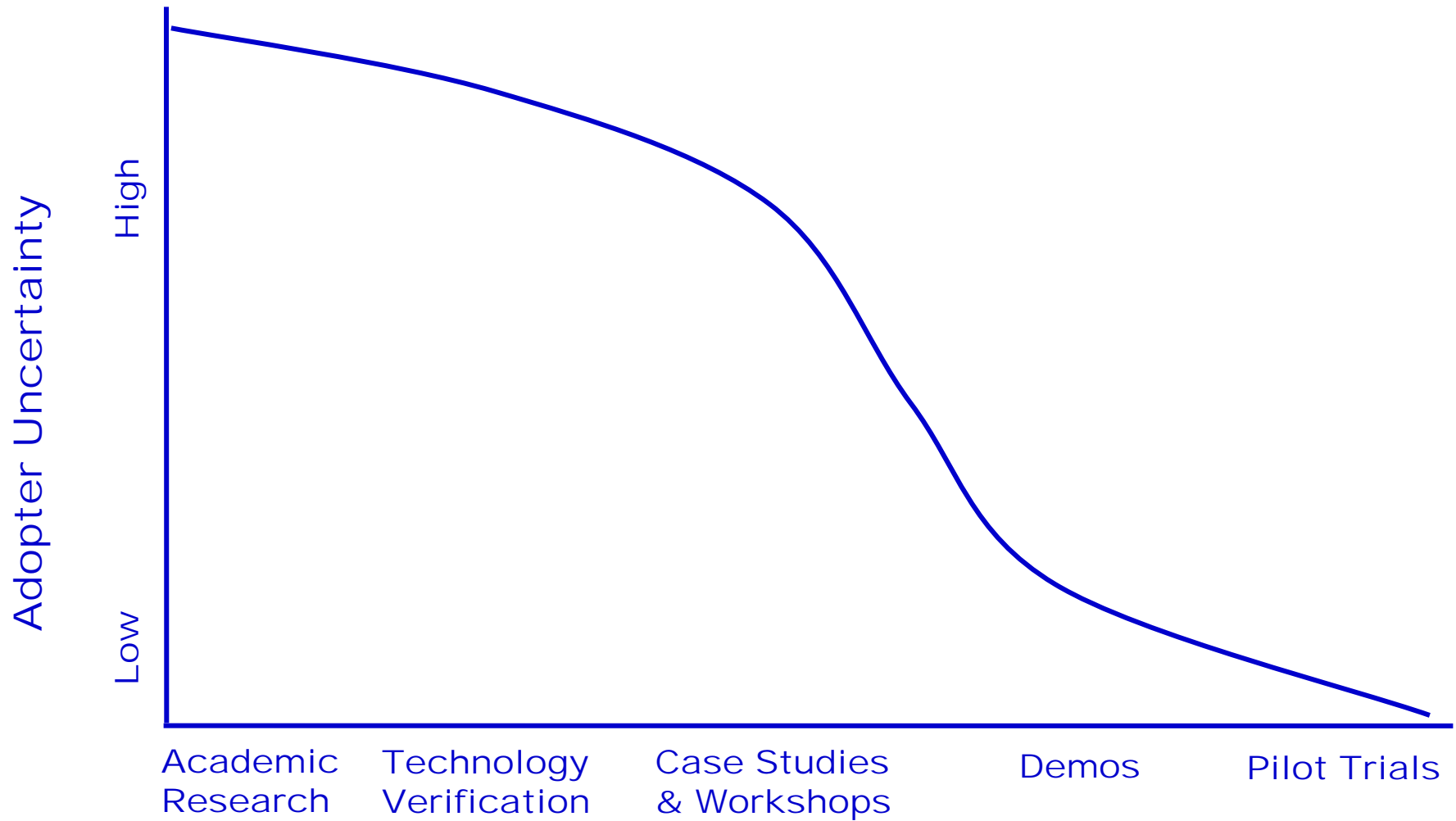


Technology Diffusion Steps

- Identify industry needs (stakeholder meeting)
- Organize technology demos working with vendor
- Coordinate technology trials or pilots at companies
- Technology implementation



Adopter Uncertainty Reduction



"Principles Knowledge"



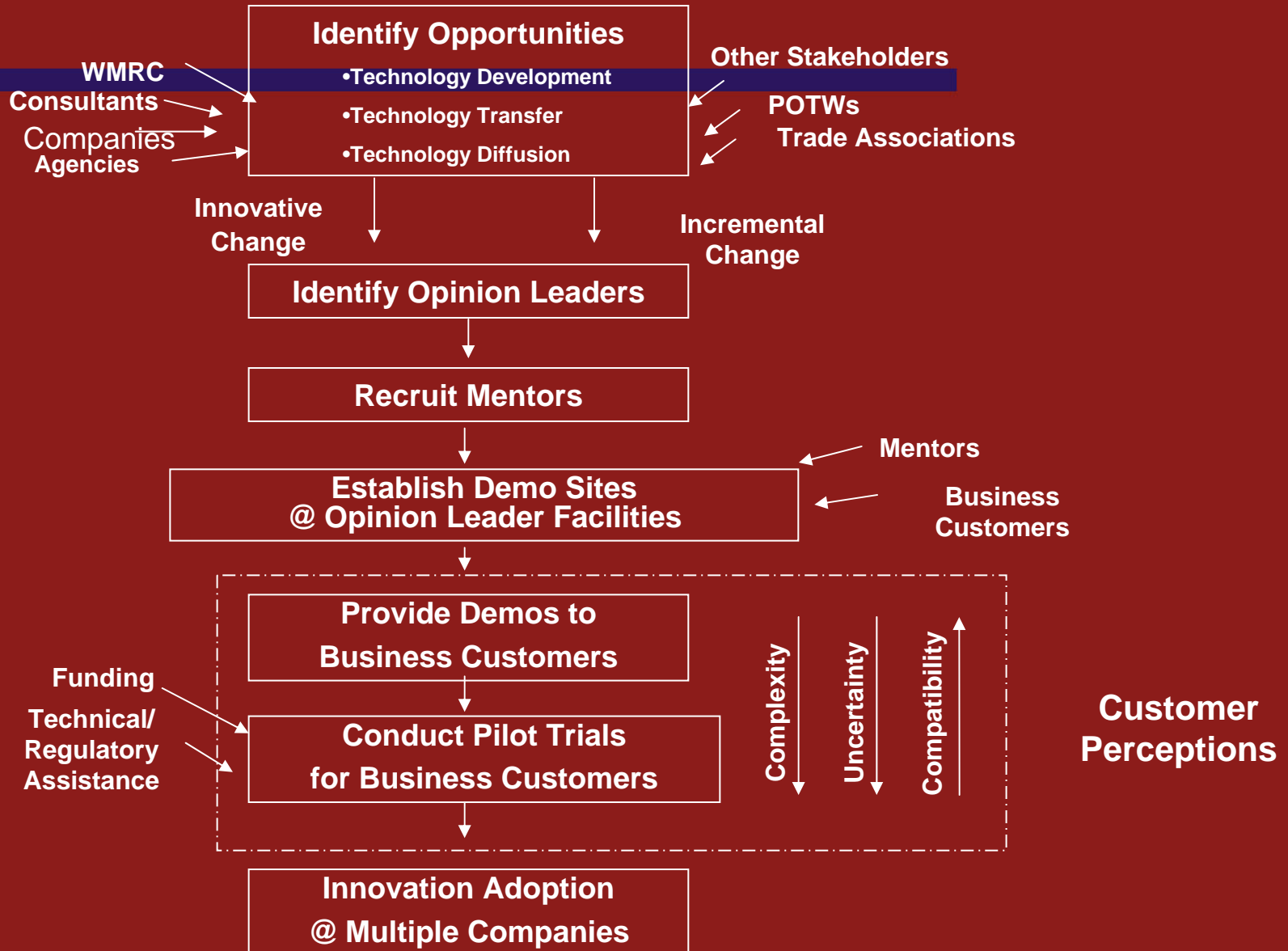
"Awareness Knowledge"



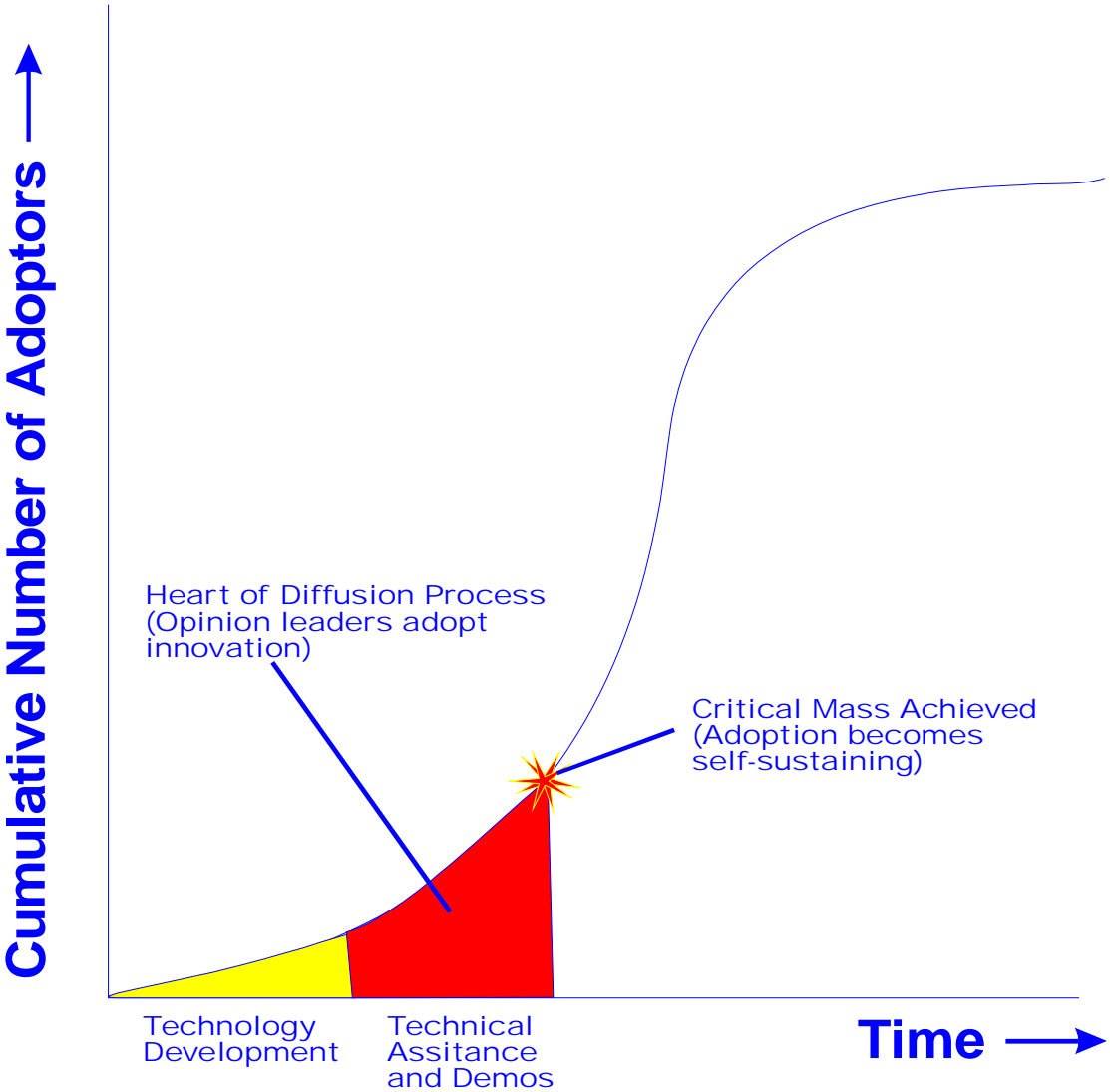
"How - To Knowledge"

Accelerated Diffusion of P2 Technologies

ADOP²T Program



Innovation Diffusion Curve



Precision Fiberglass

- Manufactures parts for agricultural vehicles, boats and other sectors
- Had a high reject rate with closed mold due to location of vacuum port
- Used resin flow software to predict how mold would fill, and relocated port
- Reduced 300 lb of waste and saved \$1,000



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2005

- Celebrated 20th anniversary
 - 13.1 million lb of air emissions
 - 324 million lb of solid and hazardous waste
 - 9 million lb wastewater loading
 - 308 million gallons water conserved



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Lessons Learned

- Relationships with businesses open doors
- Hire communications person from the start
- P2 and energy efficiency work together
- Pursue grant opportunities that help advance your mission



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Success Factors

- Establish 2-4 year targets (sectors, chemicals, etc)
- Focus on areas/sectors where there are strong partnerships (ie associations)
- Hire staff with good technical backgrounds and people skills
- Market with success stories



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Success Factors (continued)

- Set up a data management system to record everything you do
- Collect data to show success and to keep the money coming in
- Establish good relationships, communication, and partnerships with regulatory agencies—show them the “P2 way”



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Breaking down silos

- Great Printers Project
- Clean Air Minnesota



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Balancing regulatory with voluntary

- Addressing NESHAPs with SBAP



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Getting beyond “no”

- Technology diffusion
- Expertise
- \$
- Success stories
- Demos/pilots



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Building a business case

- Assessments
- Resources
- Pilots
- Cost analysis
- Recommendations



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Engaging recalcitrant sectors

- Technology diffusion
- Energy efficiency
- Regs and P2
- \$
- Success stories
- Associations



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Overcoming corporate

- Teams
- Other facilities
- Electrolux



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Dealing with territorial friction

- Team recommendations
- Demos/pilots
- Success stories
- Local regulations
- Jennie-O



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Unintended consequences

- Thomas Engineering
- Testing of n-propyl bromide as a substitute for TCE—significant health effects



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