

*Technical Assistance Programs and The
Diffusion of Environmental Technologies in
the Printing Industry: The Case of SMEs*

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Today

- Background
- Hypotheses
- Findings
- Implications for policy and research

Background

- SMEs comprise about 95% of all private firms
 - Estimated contribution of SMEs to environmental pollution is as high as 70%
- Little research on SMEs and the environment

SMEs and Environmental Policy

- Increased attention to small firms in the environmental arena
- Emergence of several programs at federal and state level to help small firms improve their environmental performance
 - Focus on information provision
- Questions regarding the effectiveness of these programs

Research Questions

- Do SMEs lag in the adoption of environmental technologies?
- What is the role of technical assistance programs in actually influencing the environmental choices of printers?
 - Are they successful?

SMEs and Tech Diffusion

- Some argue small firms lead in adoption of new technologies
- Other research suggests that small firms lag in the adoption of new technologies
 - Small firms have less risk bearing capital and knowledge
- For environmental technologies
 - knowledge is more concentrated
 - technologies often require systemic change

Hypothesis 1

- **Small firms are likely to adopt environmentally superior technologies later than larger firms.**

Sources of Environmental Information

- Firms are more likely to obtain information from sources with greater “social capital”
 - Great deal of mistrust of government
 - Given possible sources of information, government is low on social capital

Hypothesis 2

- **Firms are more likely to use non-government sponsored sources of information for technical assistance, as compared to government sponsored sources.**

The Case of SMEs

- Small firms have fewer resources to take advantage of information resources
 - Time, people, networks
- Evidence that small firms rely to a greater extent than larger firms on sources of information with high social capital

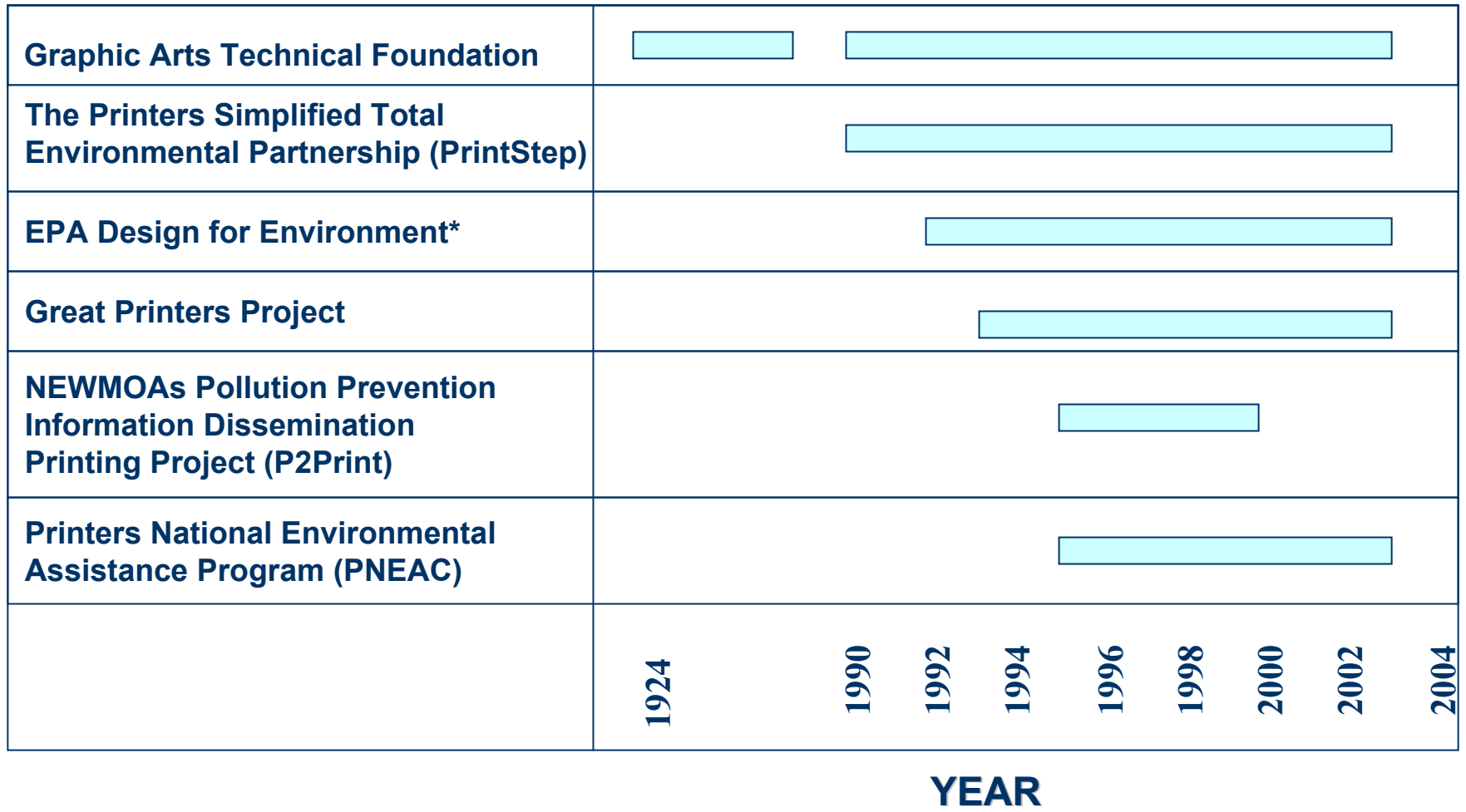
Hypothesis 3

- **Small firms are less likely than large firms to find government sponsored sources of technical assistance - even those targeted towards small firms - useful.**

Methods

- Printing Industry
 - Approx. 80% Small Firms
 - Environmental Challenges
 - Several Voluntary Assistance Programs

Program Timeline



* Flexographic Printing Project started in 1996

Methods


- Survey of 128 printers (23% response rate)
 - Dependant variable: Total and Average time since adoption of 13 environmental technology
 - Controlled for investment in other technologies, net profit per employee, level of enforcement
 - Also asked questions regarding sources of information and environmental management practices
- Interviews with program managers and program participants
 - 7 printers
 - 9 printing industry focused technical assistance programs

Findings

- Hypothesis 1 supported
 - **Small firms are likely to adopt environmentally superior technologies later than larger firms.**
- Hypothesis 2 supported
 - **Firms are more likely to use non-government sponsored sources of information for technical assistance, as compared to government sponsored sources.**

Findings: Information Sources

Lower



Organization	Mean	SD
POTW	1.3	.67
Federal Government	1.5	.74
State Government	1.6	.98
Customer	1.9	1.14
Substrate Suppliers	2.2	1.24
Other Printers	2.4	1.19
Fountain Solution Suppliers	2.7	1.33
Trade Associations	2.9	1.30
Ink Suppliers	3.0	1.27
Equipment Suppliers	3.0	1.27

Higher

Findings

- Hypothesis 3 partially supported
 - Statistically significant evidence that small firms used gov't sources less (EPA DFE, State TA, and MEP)
 - Not significant for Local SBA and PNEAC
 - Largest point estimate was for EPA DFE and State TA

Findings: What are the Obstacles?

- Small firms did not have as many resources, both environmental and in general
- Small firms not motivated to look for information
- Lack of trust in government
 - Fear of enforcement
 - Less faith in quality of information
 - Craft based culture of printing industry
 - More so for less proactive firms

“Our informal policy is to keep the EPA and DEC off our back. For the EPA, I make an annual report of our emissions to show that we are under the 25,000 lb [limit for classification as a major source of VOCs]. This is done in a mass balance calculation. I look at the MSDS, look at how much we purchased, and make the calculation from there in a spreadsheet. That’s where my one percent of time comes from.”

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“Even though we’re with the non regulatory section of the government, I think that when we come and knock on their door, [printers] automatically think the worst”

- Program Administrator

“You know the junk the government gives out...The regulators just don’t know enough about technology”

- Environmental Manager

Suggestions for Practice

- Partner and Assist Suppliers
- Partner with Industry
 - PNEAC
- Increase Social Capital / Increase Trust
 - Fear of Enforcement: New programs that merge compliance assurance with assistance have seen some success
 - Perceived Quality of Information
 - Technology demonstrations

Areas for Future Research

- Mechanisms that contribute to SME adoption of environmental friendly technologies and practices
- The role of government in helping SMEs improve environmental performance
 - Beyond information
 - Difference between compliance and voluntary pollution assistance