AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

**Adoption of Pollution Prevention: The Role of Information Spillover, Mandatory
Regulation, and Voluntary Program Participation**

Xiang Bi
Food and Resource Economics Department
University of Florida
P.O. Box 110240
Gainesville, FL 32611-0240
Tel: 352-392-1826 ext 425
xiangbi@ufl.edu

George Deltas
Department of Economics
University of Illinois
1206 South Sixth Street, Champaign, IL 61820
Tel: 217-333-4678
deltas@illinois.edu

Madhu Khanna
Department of Agricultural and Consumer Economics
Energy Biosciences Institute
University of Illinois
1301 W. Gregory Drive, Urbana, IL 61801
Tel: 217-333-5176
khanna1@illinois.edu

***Poster prepared for presentation at the Agricultural & Applied Economics Association' 2011
AAEA & NAREA Joint Annual Meeting, Pittsburgh, Pennsylvania, July 24-26, 2011***

Copyright 2011 by Xiang Bi, George Deltas and Madhu Khanna. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

Adoption of Pollution Prevention: The Role of Information Spillover, Mandatory Regulation, and Voluntary Program Participation

Xiang Bi *, George Deltas**, and Madhu Khanna**
 *University of Florida xiangbi@ufl.edu **University of Illinois at Urbana-Champaign

Introduction

- The Pollution Prevention Act of 1990 sought to encourage Pollution Prevention (P2) as the preferred method of pollution control

Figure 1. The P2 Hierarchy
 Figure from www.maine.gov/dep/innovation/p2/whatisp2.htm

- P2 information clearinghouse and voluntary programs were established to promote a P2 ethic
- The 33/50 program was the first public voluntary initiative by the U.S. EPA to reduce toxic releases of 17 chemicals by 33% by the end of 1992, and by 50% by 1995, and to encourage P2
- 33/50 participating facilities adopted more P2 technologies than non-participating facilities

Figure2. Number of P2 technologies adopted by 33/50 eligible facilities

- Facilities adopted more P2 technologies if other facilities in the same county/industry had done so

Figure3. P2 adoption by 33/50 eligible facilities and neighbors(1995)

Objectives

- Examine the extent to which the adoption of P2 technology was motivated by peers' prior experience of P2 adoption
- Examine the extent to which program participation led adoption of P2 technologies
- Examine the extent to which program participation indirectly motivated P2 adoption through demonstration

Data & Methods

- Focus on 6974 facilities eligible the 33/50 program over the period of 1991-1995
- Examine the adoption of P2 technologies for 33/50 chemicals and other chemicals in the Toxics Releases Inventory (TRI)
- Use the total number of P2 technologies adopted for 33/50 chemicals and other chemicals by peers as proxies for knowledge on P2
- Investigate two types of peers: facilities in the same county and facilities in the same industry
- Estimate the adoption of P2 technologies with respect to P2 adoption by peers in the last period, facility specific regulatory pressures, TRI releases and number of TRI chemicals
- Use instrumental variables to control for endogenous program participation
- Use location and industry fixed effects to control for exogenous contextual effects
- Use participation ratio in the same county/industry to investigate demonstration effect

Findings

- On average, participating facilities adopted more P2 activities than non-participants for 33/50 chemicals
- Program participation did not significantly motivate the adoption of P2 technologies for other TRI chemicals
- Higher participation ratios among the neighbors did not significantly increase the adoption of P2 by a facility
- Facilities adopted more P2 technologies for both 33/50 chemicals and other TRI chemicals when industry peers adopted more P2 in the previous period
- The effect of learning was small. A 50% increase in the number of P2 adopted by industry peers would lead to an 20% increase in the likelihood of P2 adoption by a facility
- After controlling for location fixed effects, learning from facilities in the same county did not significantly increase the adoption of P2 by a facility

Conclusions & Implications

- Voluntary programs targeted at certain toxic chemicals may not induce environmental technology change to address a wide spectrum of toxic pollution problems, as the direct effect of the 33/50 program on promoting P2 was limited to the targeted chemicals and program participants
- Information from industry peers should probably be given greater weights than information from the geographic neighbors when examining adoption and diffusion of environmental technology
- Future research could improve our understanding on the role of information spillover by examining the information on how to effectively use a new technology and information on the benefit of the new technology separately