



Note from the field

Helping small businesses implement toxics use reduction techniques: dry cleaners, auto shops, and floor finishers assisted in creating safer and healthier work places

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ABSTRACT

The Toxics Use Reduction Institute (TURI), Boston Public Health Commission (BPHC), and Vietnamese American Initiative for Development (Viet-AID) have worked with small business sectors to reduce their use of toxic chemicals. Three cases, described here, in dry cleaning, auto shops and floor finishing share common approaches for creating successful models of effective dissemination of toxics use reduction in small businesses. These include direct business support, peer-to-peer training and promotion of alternatives, and collaborations with stakeholders to achieve greener businesses. These results were achieved despite predictable barriers of lack of resources, suspicion of safer alternatives, and language and cultural barriers.

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1. Introduction

The mission of the Toxics Use Reduction Institute (TURI)'s Community Program is to help community organizations raise awareness of the hazards of toxic chemical use and introduce safer alternatives within their neighborhoods. The Community Program's small grants to non-profit organizations and municipalities assist them in undertaking their prioritized toxics use reduction projects. Here we describe current initiatives of the Community Program aimed at reducing toxics use in local communities by targeting three small business sectors. The Community Grants program provided support to a municipal health department, a community-based organization and directly to a small business to demonstrate and promote safer alternatives.

The Boston Public Health Commission (BPHC) received a grant from TURI to enable their Safe Shops Project to work with auto

mechanics and auto body shops to replace toxic brake cleaners, parts washers, and painting products with less-toxic and aqueous alternatives. In conjunction with occupational health and safety training, the project helped shops learn from one another by sharing their successes implementing alternative technologies. With the help of TURI, the Vietnamese American Initiative for Development (Viet-AID) worked with floor finishers, a largely Vietnamese population in the Boston area, to educate them about the hazards of toxic and flammable floor finishing products and to learn about the water-based alternatives. The project obtained the most success when they implemented a hands-on training taught by floor finishers and assisted the trained businesses in marketing the safer and healthier alternative materials. TURI's own project—conversion of dry cleaning shops into dedicated professional wet cleaning shops, was a direct effort of the Institute in collaboration with stakeholders. The goal of each of these projects was to build community awareness and support for toxics use reduction and improved working conditions so that the efforts to support change in the participating small businesses might be leveraged and extended. The cases are described in detail below.

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2. Case 1: dry cleaning

2.1. Overview

For over 10 years, TURI has researched alternatives to the use of the carcinogen perchloroethylene (PCE or perc) in garment cleaning and has worked with the Massachusetts professional garment cleaning industry to inform dry cleaners about safer garment cleaning strategies. Through hands-on learning experiences, financial assistance, and technical support, TURI has promoted adoption of wet cleaning processes in particular. Commercial scale demonstrations in Europe and California have shown that wet cleaning is a feasible and safer alternative to solvent-based dry cleaning. The wet cleaning system consists of a washer and a dryer and tensioning equipment. The system is designed to wash “dry-clean-only” clothes with water and detergents in computer-controlled machines and then finish with tensioning and pressing equipment.

TURI first assisted a dry cleaner to convert to 100% wet cleaning in 1995. However, because the technology was not advanced enough at the time to clean all types of garments, the cleaner reverted to solvent-based cleaning. Keoleian et al.’s articles in *The Journal of Cleaner Production* reviewed the status of dry versus wet cleaning technology in 1997 and 1998.¹ Since then, significant advances have been made that have improved wet cleaning equipment and processes, yet the garment cleaning industry has been slow to embrace the alternative technology.

2.2. Promoting and implementing cleaner technology

In 2007, TURI ramped up efforts to promote the new and improved wet cleaning approach. This coincided with an information campaign to make dry cleaning businesses aware that Massachusetts had recently listed PCE as a higher hazard substance under the TURA program, requiring facilities that use PCE in quantities over 1000 pounds in a year to report and plan to reduce their use of the chemical under the Toxics Use Reduction Act (TURA) program. A successful state-sponsored professional garment care project in California served as a model as TURI worked to set up a demonstration site and grant program.² TURI sought to engage the garment cleaning industry in Massachusetts with a positive message about the opportunities to promote their businesses and reap financial benefits from converting to off-the-shelf reliable wet cleaning equipment. We sought out the advice of California experts and cleaners, as well as Massachusetts trade associations, academics, community organizations, media, vendors, and electricity suppliers. This stakeholder group was engaged at the beginning of our work in order that they might feel fully committed to the project.

We began our outreach campaign with a mailing to Massachusetts garment cleaners using the Massachusetts Environmental Results Program (ERP) mailing list (the ERP regulates all dry cleaners using PCE). The mailing included information about the hazards of PCE and about available alternative garment cleaning technologies. TURI then hosted a demonstration day to allow cleaners to see wet cleaning equipment first hand (Photo 1). The Institute then advertised the availability of grant funds to support the conversion of a dry cleaner to wet cleaning equipment. Two Massachusetts cleaners were selected to receive approximately

\$17,000 to convert their facilities. In return, the cleaners collected performance, operation, and resource use data for TURI to analyze. The sites also hosted demonstration events at their facilities in order to educate other cleaners about wet cleaning and demonstrate it as a feasible alternative.

2.3. Barriers and opportunities for promoting TUR in dry cleaning

Small businesses need support and encouragement to adopt cleaner technologies. Regulations that level the playing field with universal requirements facilitate such changes and open the minds of reluctant businesses to new approaches. There are no significant regulatory incentives to induce change in the garment cleaning sector with the exception of the recent higher hazard substance listing of PCE in the TURA program that may induce larger cleaners to move towards wet cleaning or other alternatives to avoid the reporting and planning requirements.

TURI found that the garment cleaning trade associations and many cleaners are dubious about the feasibility and effectiveness of 100% wet cleaning. TURI has continuously engaged with the trade associations to gain their support in our efforts to convert shops to 100% wet cleaning. Our University-sponsored demonstration events helped to convince cleaners and the trade associations by allowing them to scrutinize the technology first hand.

In California, public utilities have financially-supported garment cleaning conversion programs in order to promote the energy and pollution savings that such conversions provide.³ However, Massachusetts utilities have only provided limited support of this project in Massachusetts (National Grid did provide \$2500 to one of the cleaners toward the conversion to wet cleaning). TURI continues to inform them of our work and provide them with resource use data from our demonstration sites to help make the case for wet cleaning as an energy saving technology.

For many dry cleaners in Massachusetts, English is not their first language. To help overcome this barrier, we provided much of our information in Korean as well as English. In addition, the second grantee dedicated wet cleaner is Vietnamese and is able to communicate his experience with wet cleaning to other Vietnamese cleaners.

Our main objective with this project has been to broaden acceptance and use of wet cleaning technology. Through our demonstration sites we have been able to educate over sixty cleaners about the updated wet cleaning technology. TURI has also engaged in conversations both on a regional and national level about the project, teaching other states and pollution prevention experts about our methods and lessons learned on this project. Throughout the project, TURI has solicited feedback from partners and stakeholders – especially from dry cleaners. While requests for written evaluation of our program efforts were not fruitful, we were able to gain guidance from cleaners in feedback sessions during events that will help guide us in future work with this sector.

3. Case 2: auto shops

3.1. Overview

Small automotive businesses represent a major source of both well paying jobs and exposure to hazardous chemicals for workers and their neighbors. The more than 550 automotive repair and body shops in Boston are primarily small independent garages

¹ Keoleian, G.A. et al. Comparative Assessment of Wet and Dry Garment Cleaning. *Journal of Cleaner Production* 1997; 5(4):279–289 and 1998; 6: 23–36.

² Sinsheimer, P., Grout, C., Namkoong, A., Gottlieb, R., & Latid, A. (2007). The Viability of Professional Wet Cleaning as a Pollution Prevention Alternative to Perchloroethylene Dry Cleaning. *Journal of the Air & Waste Management Association* (1995), 57(2), 172–178.

³ Sinsheimer, P. “Demonstrating the viability of professional wet cleaning: California and beyond.” Presentation to the Northeast Waste Management Officers’ Association, March 8, 2008. Available at: <http://www.njsbdc.com/njwetcleaning/OxyPPC.pdf>.



Photo 1. TURI wet cleaning demonstration event.

employing no more than three or four people including the owner/manager himself. Boston's auto shop workers are predominantly lower income Black and Latino (often recent immigrants) younger men with limited English fluency and limited education. Auto shops are clustered in several Boston lower income neighborhoods, often in close proximity to homes, schools, and daycare centers. Too numerous and small to be effectively targeted by enforcement agencies, many are not in compliance with existing occupational, environmental, and safe use regulations. City inspector case files paint a telling picture of improperly stored chemicals and wastes, illegal disposal of materials, uncontrolled releases of hazardous chemicals into the air, and unsafe working conditions at shops across the city.

With support from federal, city and state funds, including a grant from TURI, the Boston Public Health Commission created the Safe Shops Project in 2003 to assist these businesses in improving their operations to reduce pollution, protect their workers and neighbors, and comply with regulations. The Project takes an integrated approach to business assistance by providing worker education, connection to health care/insurance resources, toxics use reduction technical assistance, and connection to financial resources to assist in implementing changes. The worker education component includes information about shop hazards, how to find information on products, best work practices and personal protective equipment to prevent worker exposure and pollution.

The Project's technical assistance focuses on efforts to help shop owners identify products, equipment, or processes that can be upgraded or replaced in order to prevent pollution and toxic exposures. For example, most small auto repair shops use aerosol spray cans to clean brake drums and rotors before installing new brake pads. These products contain perchloroethylene or similar toxic organic solvents associated with cancer, organ damage, and neurological impairment.⁴ Additionally, the use of a spray can may result in the release of asbestos fibers from brake rotors. In auto

body shops, paint spray gun washing can result in significant worker exposures and release of solvents to the neighborhood.

3.2. Promoting and implementing cleaner technology

With a grant from TURI, the Safe Shops Project worked with three auto repair shops to implement a trial of an alternative water-based system to replace the aerosol brake cleaner and with two auto body shops to initiate use of an alternative spray gun cleaner recommended by the US EPA. The Safe Shops Project negotiated an agreement with each shop to use the water-based products exclusively for three months and the Project would pay for the cost of the safer alternative during that time. Each shop agreed to provide their feedback and comments on the experience for inclusion in the Safe Shops Newsletter mailed to all auto shops in the City of Boston. Shops that wished to continue using the product after the three-month trial period at their own expense were given large promotional banners to hang in their shop advertising the work they are doing to protect the environment and their workers.

The alternative spray gun cleaner recommended by the U.S. Environmental Protection Agency (EPA), AcraStrip 400 made by US Polychemical Corp., is a less-toxic alternative to lacquer thinner or mineral spirits. This replacement greatly improved the air quality in the shops resulting in a 98% reduction of acetone and a 59% reduction in toluene in the air in one shop, and a 94% decrease of the presence of acetone, and an 88% decrease in the presence of toluene in the air of the other (Photo 2).

The alternative brake cleaning product is a water-based non-toxic, non-flammable cleaner produced by Safety-Kleen. The product qualifies as a "wet method" under the U.S. Occupational Safety and Health Administration's (OSHA) recommendations for reducing asbestos dust exposure during brake cleaning.⁵ Normally,

⁴ Contra Costa Health Services, Hazardous Materials Program. "Aerosol cleaner use in auto repair." In *The Haz Mat Recorder*, October–December, 2007. Available at: http://cchealth.org/groups/hazmat/pdf/recorder_volume_55.pdf.

⁵ United States Department of Labor, Occupational Safety and Health Administration. "Asbestos-automotive brake and clutch repair work." *Safety and Health Information Bulletin* 07-26-2006. Available at <http://www.osha.gov/dts/shib/shib072606.html>.



Photo 2. Auto body shop demonstrates new equipment.

Safety-Kleen requires a one-year contract for the cleaning equipment (a special rolling sink/reservoir and pump) and servicing. However, the Safe Shops Project was able to negotiate an agreement with the local sales representative to pre-pay for the three-month trials for the individual shops without a contract.

After the trial period, three of the five shops (one body shop and two repair shops) adopted the water-based products. The costs of both of these systems were identical to the monthly expense of using their normal product. Both auto body and repair shops appreciated the improvement in the air quality in the shop and believed that the quality of the cleaning was comparable to the solvent-based methods. The auto repair shops observed that the aqueous brake cleaner resulted in quicker brake jobs because it eliminated brushing and scraping processes.

The Safe Shops Project staff incorporated the comments and experiences of the volunteer shops into articles in a Safe Shops Newsletter. This newsletter (<http://www.bphc.org/programs/cib/environmentalhealth/environmentalhazards/safeshops/recognitionandpress/Forms%20%20Documents/2007%20Safe%20Shops%20Newsletter.pdf>) was mailed to all of the known auto shops in the City of Boston to promote the program. The newsletter is printed in both Spanish and English and features the stories of local shops so that others can see real world examples from people they know and can follow up with. The Safe Shops Project continues to promote conversion to aqueous brake cleaner and the US EPA recommended gun washer as logical and affordable pollution prevention and toxic use reduction strategies for small auto shops.

3.3. Barriers and opportunities for promoting TUR in auto shops

Many auto shop owners and workers had had some experience with unsatisfactory alternative products many years earlier. The Safe Shops Project worked hard to dispel myths that the current generation of safer alternatives was expensive and inferior products. This required that funding be available to place alternatives

into the hands of auto shops on a free-trial basis. Shop owners are reluctant to experiment with new chemicals or devices (which may require a long-term contract) when business income is at stake. TURI funding was critical to overcoming this barrier. The promotion of successful TUR trials by the shops themselves via banners and their own words and pictures in newsletters was key to getting the attention of other shops. The Safe Shops Project hopes to continue to leverage and promote the successful demonstrations to other shops throughout the city.

4. Case 3: floor finishing

4.1. Overview

Since 2002, Viet-AID has worked with the Dorchester Occupational Health Initiative and researchers from the University of Massachusetts Lowell to better understand and address Vietnamese workers' occupational health issues. Special attention has been paid to hardwood floor refinishing, a sector that employs a high concentration of Vietnamese workers and that is an important economic anchor for the Boston Vietnamese community. There are numerous occupational and environmental health and safety issues in this sector and most workers are offered little protection from exposure to hazardous chemicals in conventional products.

In the early 2000s, house fires left three Vietnamese floor finishers dead, four badly burned, and two homes destroyed in two Massachusetts communities.⁶ Investigation of these fires found that they were caused by ignition of the highly flammable chemicals used in lacquer sealers. In response to these devastating fires and the on-going concerns about occupational and environmental

⁶ Massachusetts Department of Fire Services. "Board of Fire Prevention regulations address floor refinishing." December 14, 2009. Available at: http://www.mass.gov/Eeops/docs/dfs/news/press/20091214_floor_finishing.pdf.



Photo 3. Water-based floor finishing training.

exposures common in these small businesses, Viet-AID founded the Healthy Floor Finishing Project to promote product substitution in the sector. The first most urgent task was to promote the use of non-flammable floor finishing products to replace highly flammable products. The Project has also promoted the use of alternative hardwood floor finishing products that, in addition to being non-flammable, are less toxic and less damaging to the environment than products in common use. Many non-flammable floor finishing products contain high levels of volatile organic compounds (VOCs). Even products that comply with new the Ozone Transport Commission regulations in effect in some states (in the Northeast and Mid-Atlantic regions) can contain up to 450 g/l of VOCs. However, very-low-VOC, water-based products are available.

4.2. Promoting and implementing cleaner technology

Over the last three years, the Healthy Floor Finishing Project has engaged a wide range of stakeholders – floor finishing product manufacturers and distributors, floor finishing companies, industry, labor, community, health and safety professionals and state and municipal agencies – in efforts to promote awareness of less-toxic products in the Greater Boston area, and, in particular, among floor finishing small business owners and workers and consumers through outreach campaigns. The Project has conducted numerous hands-on trainings by floor finishers for floor finishers demonstrating the less-toxic products and has also provided technical assistance to companies switching over to alternative products.

The education and training program includes information about fire prevention and basic health and safety issues with an emphasis on product substitution to prevent fires. Hands-on segments demonstrate the application of non-flammable products, use of safer machinery, and other basic health and safety practices. The project used these trainings to make a Vietnamese-language

training film produced as a DVD for distribution to floor finishing businesses.⁷

The Project also developed content for newspapers, television and brochures about product substitution for fire prevention and to protect health and the environment. Our public education campaign included: a monthly 20-minute segment on the local Vietnamese community affairs cable television public access program; a monthly column in the Massachusetts Vietnamese-language newspaper, *Tieng Chuong*; brochures and posters on display in the largest floor finishing product supply stores serving Boston-area floor finishers; and through verbal communications via the Vietnamese–American Small Business Association.

Technical assistance for floor finishers focused on strategies for marketing healthier, environmentally-friendly floor finishing to consumers and ways to strengthen their business operations overall by improving planning, bookkeeping and regulatory compliance. The Project guided floor finishing company owners in integrating healthier products and practices into their business and marketing plans. The Project focused intensively on a group of six to eight trainees to build a model crew of “green floor finishers.” These model companies received a combination loan package for marketing activities, safer equipment and materials, such as dust-less sanding equipment and high quality water-based finishes, and financial planning. The Project worked with stakeholders to develop standards of practice that would be required to be met to qualify “green floor finishers.” Floor finishers that meet these criteria benefit from listing and marketing services, such as use of the Green Floor Finisher logo on their business cards. Program staff worked with participants to develop marketing binders featuring photos of their jobs, testimonials and references from happy customers, and information on product safety and quality. Marketing plans include identifying and targeting customers who

⁷ See <http://www.youtube.com/watch?v=eIA0uGbPPE0> for the English-language version of the video.

value healthier service. Floor finishers who meet defined standards for health and safety are promoted to potential customers on the Project website.

4.3. Barriers and opportunities for promoting TUR in floor finishing

A lack of experience with the alternative products resulted in some business owners believing that they result in a finished floor not meeting high standards. Some products do require a modification in the standard floor finishing process including small changes in tools and methods to produce good finishes. The Healthy Floor Finishing Project included testimonials and demonstrations of high quality finishes produced using water-based products and described how to modify standard methods where appropriate (Photo 3).

The greater cost to purchase water-borne and other safer products has emerged as a barrier to adoption for small companies in this highly competitive industry. The Project therefore had to teach businesses how to achieve higher fees for providing safer and healthier services. One key lesson from our project is the important role played by consumer demand in pushing product substitution in the wood floor finishing industry. Time and again, training participants and members of the floor finishing community reported that they would shift to safer and healthier products if customers requested them. The Project's marketing of the availability of greener finishers and increasing concerns about the hazards of floor finishing products did generate many calls for information on safer products and practices, and, specifically, references for floor finishers skilled at using the preferred products. Several community leaders seeking to promote safer floor finishing in their neighborhoods or residential developments expressed an urgent need for facts and materials to use in their advocacy. An important next step will be a focus on consumer education about the advantages of a less-toxic and safer approach to floor finishing.

5. Conclusion

These projects have had success by including four key elements: 1) direct funding and support to small businesses in form of grants or loans to purchase alternative materials and equipment; 2) hands-on training opportunities to learn about cleaner technologies, most often in a peer-to-peer model; 3) collaboration with industry associations, community groups, and other advocates and stakeholders; and 4) promotion and dissemination of successes to encourage similar small businesses to learn about safer alternatives. Additionally, each project was acutely sensitive to the intense demands on small businesses and their limited resources for innovation. These cases demonstrate that a model of toxics use reduction technical assistance tailored to the needs of small immigrant businesses can yield tangible results including significant reduction in both worker and community exposure to toxics. Pollution prevention agencies, health departments and community assistance programs can help implement toxics use reduction in these same sectors or expand into others, bearing in mind the common barriers and opportunities described in the cases above, such as the need to provide general business assistance and education; including information to help overcome a legacy of inferior "green" products. The need also exists to incorporate occupational health and safety concerns into toxics use reduction technical assistance in order to enable and entice small businesses to make fundamental changes. In addition to education of workers, the education of consumers and clients is also critical to the furthering of this work. Such success stories can have policy implications as regulators and elected officials feel more comfortable turning best practices into required ones. Based on these successes and with the support of TURI, the organizations involved continue to push to expand the model to other businesses. For example, the Safe Shops Project has partnered with Viet-AID to reduce hazardous exposures in nail salons throughout Boston.