



# Encouraging Dry Cleaners to switch from PERC to Professional Wet Cleaning

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# Disclaimer

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*Any opinions, findings, and conclusions or recommendations expressed in this presentation and/or discussion do not necessarily reflect the views of the New York State Department of Environmental Conservation (NYSDEC).*

# Dry Cleaning Process

Garments usually follow the process outlined below, but may skip the pretreat stage depending on the soil level

## Shirt happens

Dry cleaners are starting to remove solvents from their methods. Below is a typical dry cleaning process



**1** Garments are handed over and the customer is given a receipt



**2** Items are tagged in case garments are lost in the cleaning process



**3** Garments are sorted by fabric, stain or colour



**4** Some items undergo pre-wash treating on tough stains



**5** Drum cleaning uses solvents instead of water. Other soaps may be used to remove tough stains



**6** At the end of the 40- to 50-minute cycle high temperatures are used to evaporate the solvents



**7** Any loose buttons or other embellishments are fixed before return



**8** Spot cleaning removes stubborn stains missed by the wash



**9** Garments are pressed, usually with an industrial press, but certain delicate items are hand ironed



**10** Clean items are bagged and hung



**11** Clean items are retagged ready for collection



**12** Customer returns with corresponding receipt

# Dry Cleaning Process

Garments usually follow the process outlined below, but may skip the pretreat stage depending on the soil level

**Wet Cleaning**  
The washer and dryer are two separate machines. **No solvent is used** in the cleaning process. Biodegradable detergents, sizers, and conditioners are used. Equipment has sophisticated temperature and agitation controls.

## Shirt happens

Dry cleaners are starting to remove solvents from their methods. Below is a typical dry cleaning process





## Spotting Board



## Dry Cleaning Machines



## Wet Cleaning Machines



## Form Fitter



## Pant Tensioner



# Perc & PWC Comparison

## Perc Concerns

- **“Group 2A: Probably carcinogenic to humans”**; also a suspected developmental, gastrointestinal, kidney, reproductive, respiratory, and skin or sense organ toxicant
- **Central nervous system depressant**
- **Persistent** in water and soil and very persistent in sediment and air
- NYS has the second highest #of cleaners in the US, many on the bottom floor of apartment buildings or strip malls
  - **Apt residents** are exposed to low levels - may lead to reduced scores on tests of visual perception, reaction time, and attention
  - **Dry cleaning workers** have long term exposure to high levels, can affect the liver, brain, and kidneys

## Benefits of PWC

- **Cheapest garment cleaning system:** lowest installed system cost, smallest electricity usage per load, lowest operating cost over the first 5 years of ownership (compared to perc, HC, GreenEarth, and CO2)
- **Cleans better than other solvents** - produces whiter whites, easier to remove water based stains, cleans better than perc for some items
- **Reduces or eliminates EHS concerns & liabilities** associated with other solvents
- Dedicated wet cleaners are **exempt from NYS DEC permit & training** requirements
- Wet cleaners can **market themselves as environmentally friendly**



# NYS Professional Wet Cleaning Program

**Six year program to promote PWC across NYS**

## **Highlights:**

- All Fabric Cleaners of Farmingville & Rainbow Cleaners of New York converted from perc to dedicated PWC
- 63 attendees representing 49 cleaners attended 6 demos
- 32 attendees representing 13 stakeholders attended 2 demos
- Wet Cleaning Implementation Guide developed
- Dry cleaning & public surveys



# NYS Professional Wet Cleaning Program

Support NYS Garment Cleaning Industry

Educate NYS Consumers

Understand

Connect

Share Information

Understand

Share Information

2010 NYS garment cleaners survey

Financial assistance

PWC Conversions

Materials Developed

PWC demonstrations

2015 Customer Survey

Business Users

Public Education Campaign  
*future*

PWC conversion case studies

Wet Cleaning Implementation Guide

Brochures, handouts, etc



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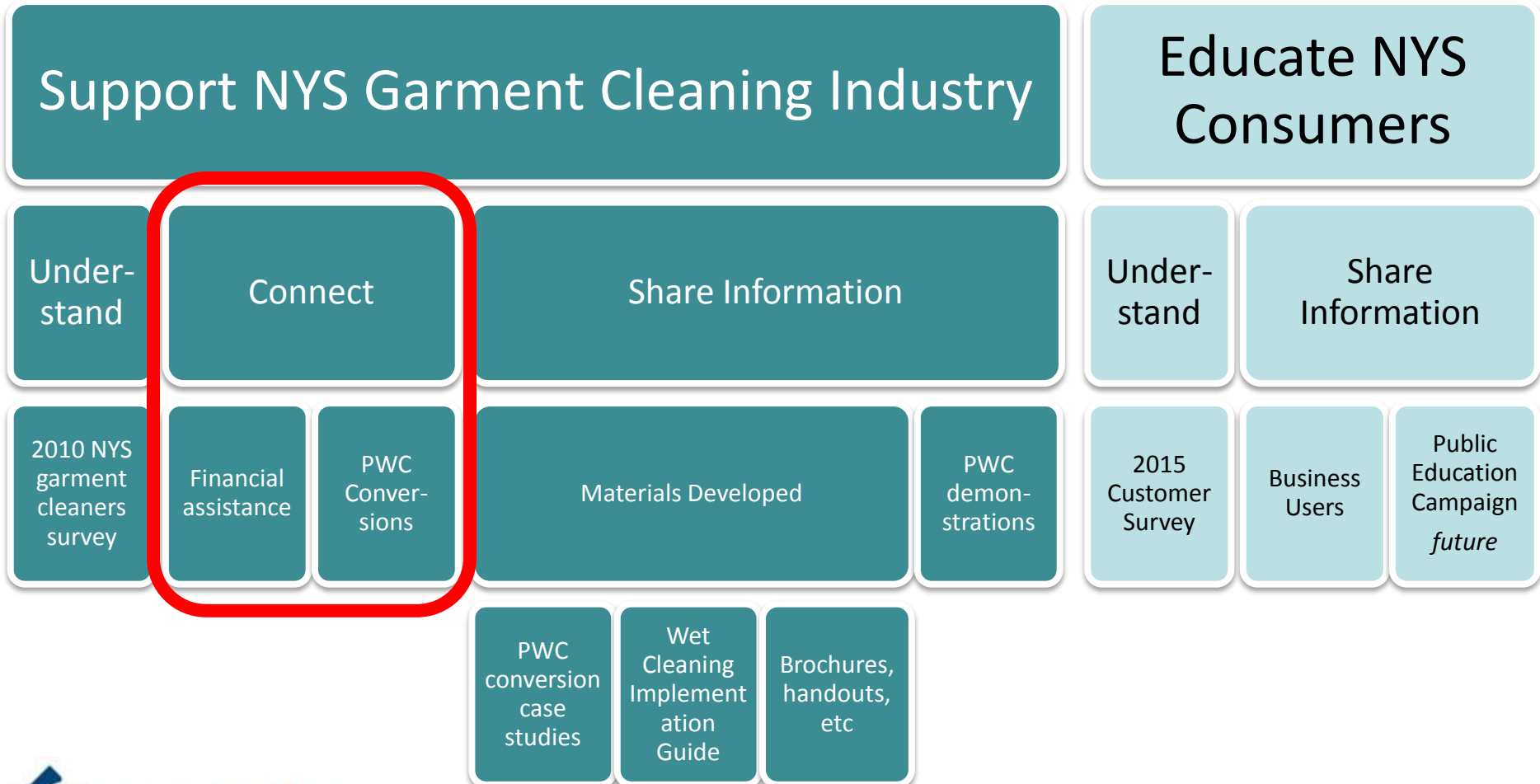
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Brochures, handouts, etc

# 2010 Garment Cleaners Survey

- Highlights
  - PWC environmental benefits well known among cleaners
  - >50% interested in using PWC, ~20% customers request PWC
  - Correlation btwn. the type of bldg. & location of the cleaner
    - 96% of collocated residential cleaners are downstate
    - 83% of cleaners upstate are in stand alone buildings
  - Biggest holdups: cleaning ability, cost, education
    - 71% PWC cannot clean all garment types & 65% believe other solvents do a better job at cleaning some garment types
    - 67% difficult to finish wet cleaned garments
    - 39% takes longer to wet clean garments than use other cleaners
    - 57% most dry cleaners do not know a lot about PWC

# NYS Professional Wet Cleaning Program



# Wet Cleaning Conversion Program

Two perc cleaners were selected by NYSP2I to receive \$17,500 from EPA Region 2 to help offset the cost of PWC equipment

## All Fabric Cleaners, Suffolk Co.

- Installed PWC system in Sept 2011, disconnected perc system in Dec & removed it in spring 2012
- System cost \$48,886 (PWC washer, dryer, pant tensioner, top tensioner, installation)



## Rainbow Cleaners, NY

- Installed PWC system in March 2012; removed perc at the same time
- System cost \$60,277 (PWC washer, dryer, pant tensioner, top tensioner, installation)





# All Fabric Cleaners Conversion

Since converting to wet cleaning, **quality has increased**, as shown by more than a **99.9% reduction in sendouts, redos, and claims**. **Electricity usage has decreased by one third and natural gas usage has also decreased**. In addition to saving money, perc use and its associated health and environmental effects as well as hazardous waste are eliminated. All Fabric's **employees are happier operating in a cleaner environment**, without the smell of perc and their **customers are pleased with the quality of cleaned garments**.



*Yong Choi, owner, proudly stands next to his wet cleaning system*

| Metrics                   | 2012 Estimated Annual Savings               | 2013 Estimated Annual Savings               |
|---------------------------|---|---|
| Performance               | 99.98% reduction in quality defects         | 99.96% reduction in quality defects         |
| Electricity usage         | 34% reduction                               | 33% reduction                               |
| Natural gas usage         | 1.6% reduction                              | 30% reduction                               |
| Detergent & spotter usage | 4% increase                                 | 11% reduction                               |
| Perc used for cleaning    | 173 gallons, 100% eliminated                | 173 gallons, 100% eliminated                |
| Filters & maintenance     | 100% eliminated                             | 100% eliminated                             |
| Hazardous waste disposal  | 766 pounds, 100% eliminated                 | 766 pounds, 100% eliminated                 |
| Perc air pollution        | 852 pounds, 100% eliminated                 | 852 pounds, 100% eliminated                 |
| NYSDEC permit             | permit eliminated                           | permit eliminated                           |
| Total                     | 12% reduction in operating costs, \$28,700+ | 13% reduction in operating costs, \$31,600+ |

Comparing Jan- Dec 2010, Jan-Dec 2012, and Jan-Dec 2013 operating data. Data are normalized to pieces cleaned in 2012.

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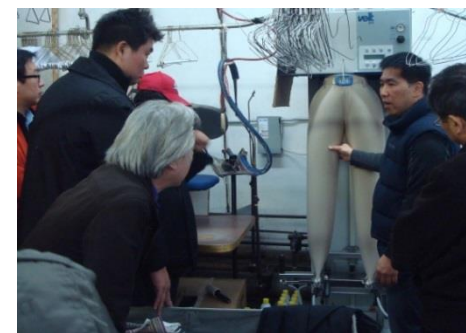
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# PWC Demonstrations

- **Cleaners** focus on those aspects critical to running a business – time it takes to clean a load, customer satisfaction, training needs, landlord relations, and most of all, cleaning ability
- **Stakeholders** more interested in potential funding opportunities for cleaners to convert to PWC, methods other states have funded conversion programs, NYSP2I's thoughts to further disseminate PWC information to NYS cleaners, and feedback we have received from cleaners on the demonstrations



# PWC Demonstrations for Cleaners

- **Major challenge:** identifying cleaners willing to host
- 63 people representing 49 cleaners attended 6 demos
- Cleaners attended for four reasons:
  1. Main: get a **general understanding of PWC**
  2. **Cleaning ability** as compared to perc, especially wool
  3. Many **landlords** won't allow cleaners to continue to use perc
  4. **Concerns with perc** - cost, regulatory burdens, and customers - are forcing cleaners to consider alternatives





# Demo Follow ups

- All attendees mentioned **space and financial constraints** as the main barriers to moving forward with PWC
  - Cost of replacing their system is too high and is difficult for cleaners to justify the expense
  - No state or federal financial incentives
- Perceptions
  - PWC viewed more favorably
  - Some remain skeptical PWC can clean all garment types
  - Few satisfied with their hydrocarbon systems
  - **More likely to install PWC when their system needs to be replaced after attending the demo**



# PWC Demonstrations for Stakeholders

- 32 people representing 13 organizations attended two demos
- Attendees learned
  1. Difference between laundry & PWC,
  2. Motivations for PWC, and
  3. PWC performs as well as or better than perc





# New York State Pollution Prevention Institute Wet Cleaning Program

## Wet Cleaning Benefits

A wet cleaning system is made up of sophisticated equipment, including **washing machines that simulate handwashing and dryers that don't overdry**. Tensioning finishers ensure jackets, pants, and other structured garments are properly **finished without shrinking**.

**Wet cleaning cleans better than perc.** It has been shown to produce whiter whites, is easier to remove water based stains, and performs better than perc for some items such as heavily soiled garments.

Wet cleaning significantly **reduces or eliminates human health and environmental concerns and their liability** often seen with perc and other alternatives. Perc is a known carcinogen and can affect dry cleaning workers and apartment residents living near and above dry cleaners. Perc is hazardous to the environment because it takes a long time to break down in air, soil, and water.

Wet cleaners can market their business as **green or environmentally friendly**.

Wet cleaning is the least costly dry cleaning method. Dry cleaners are **saving money by converting to wet cleaning!**

### MA Perc Cleaner saves \$3K a year Wet Cleaning

Silver Hanger Cleaners in Bellingham Massachusetts converted their operations from perc to 100% professional wet cleaning in 2008. Data was collected for one year operating with perc and one year operating with wet cleaning. **The cleaner saves \$2,700 a year with wet cleaning.**

- Electricity for wet cleaning and laundering decreased 20%
- Electricity to power the heating and cooling system decreased 20%
- Water for cleaning and laundering decreased 3%
- Natural gas to provide steam and hot water decreased 14%
- Maintenance costs decreased \$227 per month
- Filters, solvent, hazardous waste disposal and regulatory fees were eliminated at \$356 per month
- Detergent and spotting agent costs increased \$672 per month
- Equipment costs were reduced by \$500 per year
- Claim costs were reduced by \$1,000 per year

Source: Toxics Use Reduction Institute, Eliminating the use of Toxic Chemicals in Dry Cleaning, Case Study of Silver Hanger Cleaners, Bellingham, MA

| Garment Cleaning Solvent  | Average Installed System Cost <sup>1</sup> | Avg. Natural Gas Usage per Month (therms) <sup>2</sup> | Avg. Electricity Usage per load (kWh) <sup>2</sup> | Avg. Cost for first 5 years of Typical Size Dry Cleaner <sup>2</sup> |
|---------------------------|--|--|--|--|
| Perchloroethylene         | \$52,000                                   | 531  | 6.2  | \$27,376   |
| Hydrocarbon               | \$59,000                                   | 243  | 6.2  | not applicable   |
| DF-2000 Fluid             | not available                              | not available  | not available                                      | \$27,911   |
| Pure Dry                  | not available                              | not available  | not available                                      | \$28,535   |
| Eco Solv                  | not available                              | not available  | not available                                      | \$27,872   |
| Shell Sol 140 HT          | not available                              | not available  | not available                                      | \$27,755   |
| Stoddard Solvent          | not available                              | not available  | not available                                      | \$28,308   |
| GreenEarth                | \$61,000                                   | 297  | 6.2  | \$32,718   |
| Liquid Carbon Dioxide     | \$140,000                                  | 156  | 9.3 – 9.7  | \$58,881   |
| Professional Wet Cleaning | \$47,000                                   | 388  | 3.2 washer 5.8 dryer                               | \$20,926   |

<sup>1</sup> Alternatives to Perchloroethylene Use in Drycleaning, City of Los Angeles Environmental Business and Neighborhood Services Division.

<sup>2</sup> California Dry Cleaning Industry Technical Assessment Report, State of California Air Resources Board, February 2006.



The New York State Pollution Prevention Institute was established in 2008 to make New York State more sustainable for workers, the public, the environment and the economy through reductions in toxic chemical use, emissions to the environment, and waste generation; and the efficient use of raw materials, energy and water.

#### For more info, contact

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#### Or visit our website at

[http://www.nysp2i.rit.edu/wet\\_cleaning.html](http://www.nysp2i.rit.edu/wet_cleaning.html)





A wet cleaning system is made up of so equipment, including **washing machines that handwashing and dryers that don't overdry**. finishers ensure jackets, pants, and other garments are properly **finished without shrink**

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The New York State Pollution Preventio make New York State more sustainable f and the economy through reductions i environment, and waste generation; a energy and water.

# Professional Wet Cleaning Implementation Guide

New York State Pollution Prevention Institute  
 Rochester Institute of Technology  
 August 2013





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## Professional Wet C Implementation

# The Benefits of Professional Wet Cleaning


*Wet cleaning helps you save money while cleaning garments effectively and reducing your environmental footprint.*

New York State Pollution  
Rochester Inst



**New York State  
Pollution Prevention Institute**

Rochester Institute of Technology  
111 Lomb Memorial Drive  
Rochester, NY 14623-0426  
[www.nysp2i.rit.edu](http://www.nysp2i.rit.edu)

 **NYS Pollution Prevention Institute**

NYSP2I is addressing the use of perchloroethylene (perc) in the NYS garment cleaning industry by promoting professional wet cleaning, an economically and environmentally preferable alternative, through the Professional Wet Cleaning Program.



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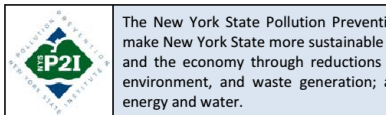
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## New York State Pollution Prevention Institute Wet Cleaning Program

### The Benefits of Professional Wet Cleaning

*A Case Study of All Fabric Cleaners, Farmingville, NY*

*The goal of NYSP2I's Wet Cleaning Program is to reduce the use of toxic perchloroethylene (perc) in the NYS garment cleaning industry by promoting environmentally preferable alternatives through information dissemination, assisting cleaners in the conversion to professional wet cleaning, and holding demonstrations at established wet cleaners.*

#### History of Cleaning at All Fabric Cleaners

All Fabric Cleaners, located at 2316 North Ocean Avenue, Farmingville, New York has operated with perchloroethylene, commonly referred to as perc, as their dry cleaning solution for the last 15 years. All Fabric's owner, Yong Choi, was interested in the promise that professional wet cleaning is not only healthier for the environment and employees but it can clean many garments better than perc. In 2011, Yong visited many successful wet cleaning shops and attended The Cleanshow to learn more about the benefits and practicality of wet cleaning. Yong was selected for NYSP2I's Wet Cleaning Conversion Program, a NYSDCE and USEPA Region 2 jointly funded initiative providing financial and technical assistance to cleaners converting their operations from perc dry cleaning to professional wet cleaning.

#### Conversion from Perc to Professional Wet Cleaning

All Fabric Cleaners installed their professional wet cleaning system – consisting of a washer, dryer, top tensioner, and pant tensioner – in September 2011. At the time of installation, the perc dry cleaning system was not removed from the shop, as Yong intended to gradually convert his operations over to wet cleaning. The system proved successful beyond Yong's expectations. The perc dry cleaning system was disconnected in December 2011 and removed in spring 2012.



Yong Choi, owner, proudly stands next to his wet cleaning system

#### Professional Wet Cleaning Success at All Fabric Cleaners

Since converting to wet cleaning, quality has increased, as shown by more than a 99.9% reduction in sendouts, redos, and claims. Electricity usage has decreased by one third and natural gas usage has also decreased. In addition to saving money, perc use and its associated health and environmental effects as well as hazardous waste are eliminated. All Fabric's employees are happier operating in a cleaner environment, without the smell of perc and their customers are pleased with the quality of cleaned garments.

| Preliminary Metrics             | 2012 Estimated Annual Savings                     | 2013 Estimated Annual Savings                     |
|---------------------------------|---|---|
| Performance                     | 99.98% reduction in quality defects               | 99.96% reduction in quality defects               |
| Electricity usage               | 34% reduction                                     | 33% reduction                                     |
| Natural gas usage               | 1.6% reduction                                    | 30% reduction                                     |
| Detergent & spotter usage       | 4% increase                                       | 11% reduction                                     |
| Perc used for cleaning          | 173 gallons, 100% eliminated                      | 173 gallons, 100% eliminated                      |
| Filters & equipment maintenance | 100% eliminated                                   | 100% eliminated                                   |
| Hazardous waste disposal        | 766 pounds, 100% eliminated                       | 766 pounds, 100% eliminated                       |
| Perc air pollution              | 852 pounds, 100% eliminated                       | 852 pounds, 100% eliminated                       |
| NYSDCE permit                   | permit eliminated                                 | permit eliminated                                 |
| <b>Total</b>                    | <b>12% reduction in operating costs, \$28,725</b> | <b>13% reduction in operating costs, \$31,620</b> |

Comparing Jan- Dec 2010, Jan-Dec 2012, and Jan-Dec 2013 operating data. Data are normalized to pieces cleaned in 2012.

|  |   |   |
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|  | <p>The New York State Pollution Prevention Institute was established in 2008 to make New York State more sustainable for workers, the public, the environment and the economy through reductions in toxic chemical use, emissions to the environment, and waste generation; and the efficient use of raw materials, energy and water.</p> | <p><b>For more info, contact</b><br/>         Kate Winnebeck<br/>         585-475-5390, kate.winnebeck@rit.edu<br/> <b>Or visit our website at</b><br/> <a href="http://www.rit.edu/affiliates/nysp2i/professional-wet-cleaning-program">http://www.rit.edu/affiliates/nysp2i/professional-wet-cleaning-program</a></p> |
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# Understanding Consumers' Behavior & Knowledge of Professional Garment Cleaning in NYS

- Goal to understand what NYS consumers know about dry cleaning and PWC, factors that are considered when selecting a cleaner, & factors that influence the preference for an eco-friendly cleaner

## Results Summary

- 86% don't know what their cleaner uses in the cleaning process
- 50% of those that have used a PWC did so specifically bec. they wet clean
- Online articles and friends and/or family are the most popular methods respondents have received PWC information
- Location and price are the most significant factors when choosing a garment cleaner; professional wet cleaning ranked 5 out of 7



# Understanding Consumers' Behavior & Knowledge of Professional Garment Cleaning in NYS

## **“Environmentally Friendly” messaging is critical**

- 52% *most likely* or *definitely* would use garment cleaning services more if they were advertised as environmentally friendly
- 35% have *no preference* in advertising terms; 30% prefer *natural*, 15% prefer *organic*, and 6% prefer *professional wet cleaning*
- About 50% are willing to pay 10% more for a cleaner advertised as environmentally friendly
- Consumers are more willing to spend 10% more than travel to a less preferred location for an environmentally friendly garment cleaner

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# Business & Commercial Users

- Targeting commercial users has a larger potential impact than targeting individual consumers
- Currently targeting approximately 3,000 businesses that use garment cleaning as part of their operations
  - Formal wear & costume rental companies
  - Theater companies
  - Hotels & motels with sales of at least \$1MM

# Summary of Challenges & Needs

- Lack of funding for conversions
- Upstate wet cleaners not willing to host demonstrations – view PWC as competitive advantage (can often charge more) & don't want to give up their secrets
- Fear among some customers to use PWC as they don't understand what it is
- Some cleaners remain skeptical that PWC can clean all garment types



# Future Work

- Develop a public education and outreach campaign
  - Aimed at many types of users
  - Results of the 2015 Customer Survey will be used to drive development
- Continue to connect with NYS cleaners
- Continue to share conversion case studies & info learned at the demonstrations
- Continue to connect & collaborate with others working in this space to broaden our reach and pool resources & expertise