Demonstrating the Viability of Professional Wet Cleaning: California and Beyond

Presentation to:
North East Waste Management Officer’s Association

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Occidental College
Background of Garment Care Industry

30,000+ dry cleaners in the U.S.
- 85% use perchloroethylene (PERC)
- Most are small Mom and Pop shops
- 50% Korean ownership

Adverse health & environmental effects of PERC
- Probable human carcinogen (IARC)
- Dizziness, headaches, impaired judgment
- Toxic air contaminant, groundwater pollutant

Liability concerns (Superfund; landlord restrictions)

PCE dry cleaning highly regulated
Non-PERC Dry Cleaning Alternatives

**Petroleum**
- Exxon-Mobil, Shell, Chevron.
- Higher capital costs.
- Fire Hazard, Hazardous waste; VOC emissions.
- More energy intensive.

**Liquid Carbon Dioxide**
- Non-toxic, zero-emission.
- Very high capital costs.

**Silicone**
- General Electric.
- Higher capital costs, Annual fee.
- Fire Hazard; Hazardous waste.
- Recent evidence of toxicity.
- More energy intensive.

**Professional Wet Cleaning**
- Zero-emission, non-toxic, energy efficient.
- Lower capital and operating costs.
- Requires additional training.
Definition of Professional Wet Cleaning

“Wet cleaning is a process for cleaning sensitive textiles (wool, silk, rayon, natural and man-made fibers) in water by professionals using a special technology and detergents that lead to minimum fabric shrinkage and damage. It is followed by an appropriate tumble drying and restorative finishing procedure.”

(European Wet Cleaning Committee)
Professional Wet Cleaning Washer/Dryer System

← Computer-Controlled Washing
- Ultra gentle agitation simulates hand washing
- Low water level and low water temperature
- High extraction speed

Moisture Sensor Drying →
- Precise moisture control
- Detects moisture in garment
- Prevents over drying

Manufacturers: 8 wet clean washer firms, 5 wet clean dryer firms
Professional Wet Cleaning Detergent Dispensing

Dispensing System: Precise amount of bio-degradable cleaning agents mixed with water before release into the cleaning drum.

Cleaning Agents: Formulated to maximize cleaning power while minimizing color change and shrinkage.

- Detergents remove stains/soils.
- Conditioners smooth and soften.
- Sizing adds body and enhances finishing.

Manufacturers: 15+ firms formulating wet cleaning surfactants.
Specialized Tensioning Presses

**Tensioning Presses:** used to enhance restoration of constructed garments, such as suit jackets, suit pants, and tailored items.

- Steam to relax fibers, Tension to restore length and form, Hot air to dry.

**Manufacturers:** 12 firms building both tensioning form and pants toppers
Key Barriers to the Diffusion of Professional Wet Cleaning

• Cleaners Not Aware of Capabilities of Technology
  – Fear of garment shrinkage/damage
  – Fear that process takes longer
  – Fear of customer response

• “Dry Clean Only” Care Label

• Lack of Vendor Infrastructure

• Lack of Stakeholders Knowledge
  – Govt, policy makers, real estate and banking, env. NGOs, and consumers.
Professional Wet Cleaning Demonstration Project

Funders, Collaborators, & Advisory Board

- Governmental Agencies
- Cities
- Energy Utilities
- Garment Care Associations
- Garment Manufacturers
- Environmental and Community Groups
- Universities
- Private Foundations
Professional Wet Cleaning Commercialization Project

• Start Date: 1995

• Provide grant funding and technical assistance to dry cleaners willing to switch to professional wet cleaning and serve as demonstration sites.

• Demonstrate technology to other cleaners.

• Evaluate ability to successfully switch.
Bob’s Cleaners: Richmond
November 2006
Sunny Fresh Cleaners, La Jolla
March 2007
Colony Cleaners, Malibu
February 2007
Southern California Edison Seminar
October 30, 2005
Research Questions for Determining Viability of Professional Wet Cleaning

Performance Capability
  – Can professional wet cleaners effectively clean the garments they would have previously dry cleaned?

Financial Capacity
  – Are the costs in professional wet cleaning comparable to dry cleaning?

Environmental Impact
  – Are there any adverse environmental impacts?
The Viability of Professional Wet Cleaning as a Pollution Prevention Alternative to Perchloroethylene Dry Cleaning

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Occidental College, Los Angeles, CA
Abid Latif
South Coast Air Quality Management District, Diamond Bar, CA
# San Francisco Bay Area/San Diego Demonstration Program

<table>
<thead>
<tr>
<th>Name of Cleaner</th>
<th>Region</th>
<th>City</th>
<th>Conversion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob’s Cleaners</td>
<td>Bay Area</td>
<td>Richmond</td>
<td>July 2006</td>
</tr>
<tr>
<td>Hesperian Cleaners</td>
<td>Bay Area</td>
<td>San Lorenzo</td>
<td>January 2007</td>
</tr>
<tr>
<td>Delight Cleaners</td>
<td>Bay Area</td>
<td>Sunnyvale</td>
<td>September 2007</td>
</tr>
<tr>
<td>Sunny Fresh Cleaners</td>
<td>San Diego</td>
<td>La Jolla</td>
<td>January 2007</td>
</tr>
<tr>
<td>Nancy’s Cleaners</td>
<td>San Diego</td>
<td>Alpine</td>
<td>May 2007</td>
</tr>
</tbody>
</table>
Performance Evaluation

• Can cleaners effectively wet clean garments that they would have previously dry cleaned?
Problem Garment Evaluation

- Send Out: 0.06%
- Returned: 0.02%
- Ruined: 0.01%

Dry Clean
Wet Clean
Overall Success Rate

Dry Clean

Wet Clean
Customer Retention Evaluation

“How many customers have you lost due to your switch from PCE dry cleaning to professional wet cleaning?”

- Customers Lost: 0.5%
- Retention Rate: 99.5%
Financial Evaluation

- Are capital and operating costs in professional wet cleaner comparable to a PERC dry cleaner?
## Capital Equipment Cost

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Dry Cleaning</th>
<th>Wet Cleaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washer/Dryer System</td>
<td>$50,000-$65,000</td>
<td>$15,000-$35,000</td>
</tr>
<tr>
<td>Tensioning Pants Topper</td>
<td>NA</td>
<td>$10,000-$15,000</td>
</tr>
<tr>
<td>Tensioning Form Finisher</td>
<td>NA</td>
<td>$10,000-$15,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$50,000-$65,000</strong></td>
<td><strong>$35,000-$65,000</strong></td>
</tr>
</tbody>
</table>
Process-Dependent Operating Costs

![Costs for different processes and stores](chart.png)

- **Bob's**: $3,000 (Dry Clean), $1,500 (Wet Clean)
- **Hesperian**: $2,500 (Dry Clean), $1,000 (Wet Clean)
- **Delight**: $3,500 (Dry Clean), $2,000 (Wet Clean)
- **SunnyFresh**: $2,000 (Dry Clean), $1,500 (Wet Clean)
- **Nancy's**: $1,500 (Dry Clean), $1,000 (Wet Clean)
Process-Dependent Cost:
Sunny Fresh Cleaners

![Bar chart showing monthly expenses for different categories such as Filter cost, Reg fees, Haz.waste, Solvent, Mach. Maint., Electricity, Gas, Equipment, and Detergent, with expenses ranging from $0 to $700. The chart compares Dry Clean and Wet Clean expenses.]
## Labor Efficiency

<table>
<thead>
<tr>
<th></th>
<th>Volume Increase/Labor Same</th>
<th>Volume Increase/Labor Increase</th>
<th>Volume Same/Labor Same</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob’s</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hesperian</td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Delight</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunny Fresh</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Nancy’s</td>
<td>√</td>
<td></td>
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</tbody>
</table>
Resource Use

- What are the impacts in energy and water use?
Dry Clean Resource Use
Dry Cleaning Process
Professional Wet Clean Resource Use
Professional Wet Cleaning Process-Flow Chart
Electricity Use
kWh/Month

Bob's Hesperian Delight SunnyFresh

Dry Clean
Wet Clean

kWh/Month

0 1,000 2,000 3,000 4,000 5,000

Bob's  Hesperian  Delight  SunnyFresh
Natural Gas Use
Therms/Month

![Bar Chart]

- Bob's
- Hesperian
- Delight
- SunnyFresh

- Therms/Month
- Dry Clean
- Wet Clean
Water Use

![Bar chart showing water use by different locations: Bob's, Hesperian, Delight. The chart compares water use for Dry Clean and Wet Clean processes.](image)
Cleaners’ Concerns About Switching to Wet Cleaning Technology

<table>
<thead>
<tr>
<th></th>
<th>Poor Performance</th>
<th>Increased Cost</th>
<th>Customer Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob’s</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hesperian</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Delight</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Sunny Fresh</td>
<td>√</td>
<td></td>
<td></td>
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<tr>
<td>Nancy’s</td>
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</tbody>
</table>
Biggest Difficulties in Making the Switch to Professional Wet Cleaning

<table>
<thead>
<tr>
<th></th>
<th>Training/ Tech Support</th>
<th>Fear of Harming Garments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob’s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hesperian</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Delight</td>
<td>√</td>
<td>√</td>
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<tr>
<td>Sunny Fresh</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Nancy’s</td>
<td>√</td>
<td></td>
</tr>
</tbody>
</table>
Importance of training in making a successful transition

<table>
<thead>
<tr>
<th>Not at all Important</th>
<th>Not too Important</th>
<th>Somewhat Important</th>
<th>Very Important</th>
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<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
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</table>
## Owner Satisfaction

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching was good business decision</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Would recommend technology to other cleaners</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>
## Symptoms Operating as PCE Dry Cleaner

<table>
<thead>
<tr>
<th></th>
<th>Headache</th>
<th>Dizziness</th>
<th>Fatigue</th>
<th>Nausea</th>
<th>Nasal Irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob’s</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hesperian</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Delight</td>
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<tr>
<td>Nancy’s</td>
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<td></td>
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### Symptoms Operating as Professional Wet Cleaner

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</table>
Growth of Dedicated Professional Wet Cleaning

![Chart showing the growth of dedicated professional wet cleaning in California and other states from 1999 to 2007. The chart indicates a significant increase in prevalence, with California showing a steady rise, while other states have a more fluctuating pattern.](image-url)
Demonstration Programs

• LA Region
  – 8 demo sites: 2000-2004
  – 14 demo sites: 2005-present

• Bay Area
  – 9 demo sites: 2006-present

• Sacramento
  – 3 demo sites: 2007-present

• San Diego
  – 3 demo sites: 2007-present
2003 California Environmental Garment Care Incentive Program (AB998)

• Fee on PERC used in dry cleaning.
• Fee creates $10,000 incentives for PERC dry cleaners switching to non-toxic and non-smog forming technology.
• Establishes demonstration program.
2007 California PCE Dry Cleaning Phase Out

• New Machines:
  – No PCE dry clean machines installed after 1/1/2008.

• Existing Machines:
  – PCE dry clean machine permitted to operate for a maximum of 15 years.
  – Implementation Date: 7/1/2010.
Energy Utility Incentives to Switch to Professional Wet Cleaning

- Los Angeles Department of Water and Power = $4,000.
- San Diego Gas and Electric = $5,000 for 2 demo sites.
- Pacific Gas & Electric = $5,000 for 3 demo sites.
- Pasadena Water & Power = $5,000 for 1 demo site.
- Burbank Water & Power = $10,000 for demo sites.
“Dry Clean Only” Care Label

- Federal Trade Commission (FTC) regulates care labeling.
- EPA asked FTC to develop “Professional Wet Clean” care label because of ongoing risk of PCE dry cleaning.
- In 1999 FTC evaluated creation of “Professional Wet Clean” care label.
- FTC waiting to take action until formal test procedure developed for professional wet cleaning.
International Care Label System for Professional Wet Cleaning

<table>
<thead>
<tr>
<th>Process Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>☀️</td>
<td>PROFESSIONAL WET CLEANING</td>
</tr>
<tr>
<td>☀️</td>
<td>NORMAL PROCESS</td>
</tr>
<tr>
<td>☀️</td>
<td>PROFESSIONAL WET CLEANING</td>
</tr>
<tr>
<td>☀️</td>
<td>MILD PROCESS</td>
</tr>
<tr>
<td>☀️☺️</td>
<td>PROFESSIONAL WET CLEANING</td>
</tr>
<tr>
<td>☀️☺️</td>
<td>VERY MILD PROCESS</td>
</tr>
</tbody>
</table>

ISO, May 2005
Conclusions

• Professional wet cleaning is a viable non-toxic, energy-efficient substitute technology for dry cleaning.

• Technology affordable to mom-and-pop cleaners (>95% of market).

• Need to overcome significant barriers to diffusion.

• Financial incentives recommended (e.g. energy rebates, etc.).

• Demonstration program essential to jump-start diffusion.
Contact Information

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