

# **Demonstrating the Viability of Professional Wet Cleaning: California and Beyond**

Presentation to:  
North East Waste Management Officer's Association

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# 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.

Tensioning Form Finisher



Tensioning Pants Topper



**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

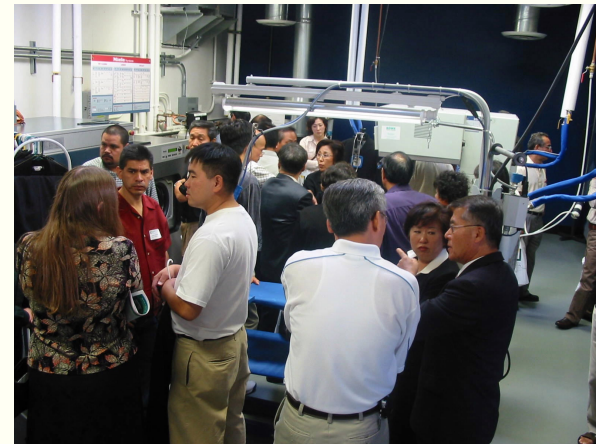
## March 2007



# 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?

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## The Viability of Professional Wet Cleaning as a Pollution Prevention Alternative to Perchloroethylene Dry Cleaning

**Peter Sinsheimer, Cyrus Grout, Angela Namkoong, and Robert Gottlieb**

*Occidental College, Los Angeles, CA*

**Abid Latif**

*South Coast Air Quality Management District, Diamond Bar, CA*



# San Francisco Bay Area/San Diego Demonstration Program

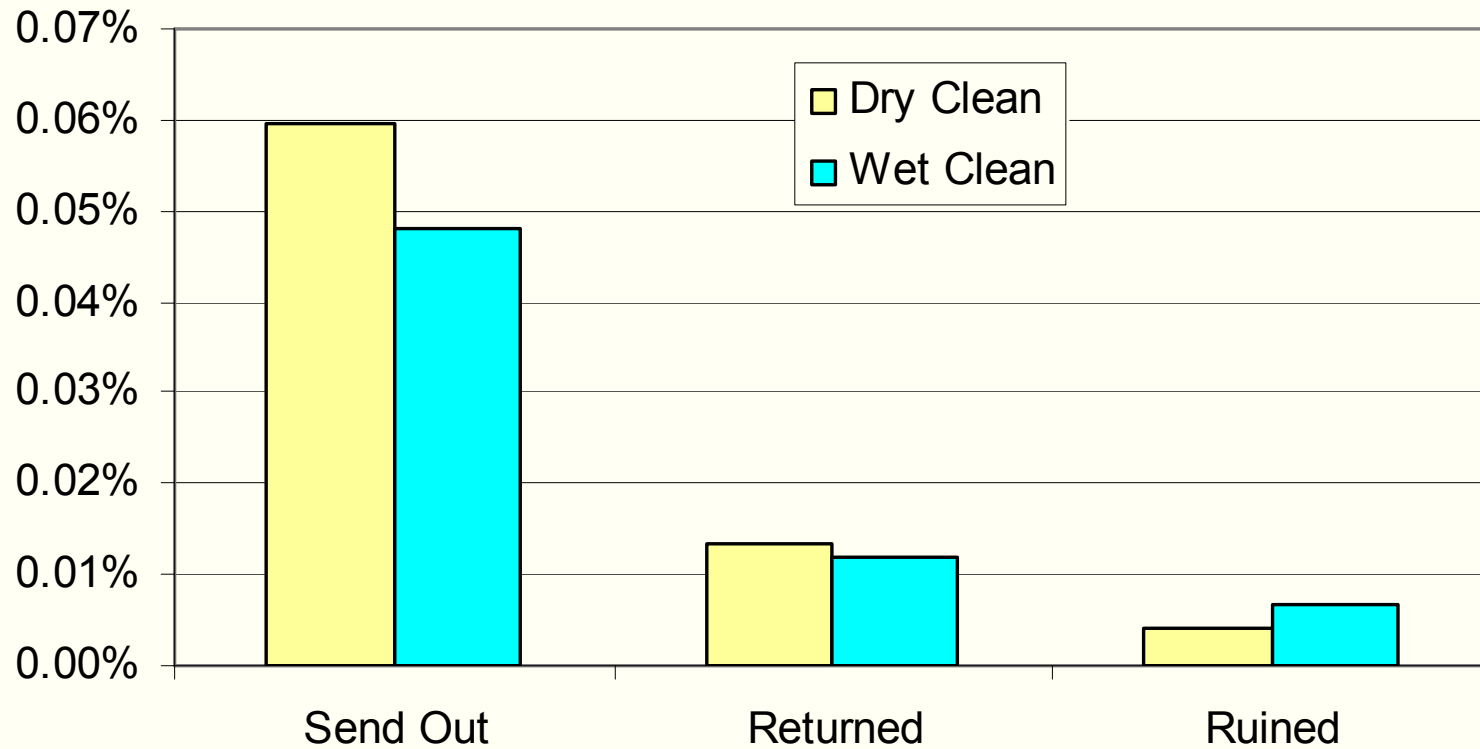
<b>Name of Cleaner</b>	<b>Region</b>	<b>City</b>	<b>Conversion Date</b>
Bob's Cleaners	Bay Area	Richmond	July 2006
Hesperian Cleaners	Bay Area	San Lorenzo	January 2007
Delight Cleaners	Bay Area	Sunnyvale	September 2007
Sunny Fresh Cleaners	San Diego	La Jolla	January 2007
Nancy's Cleaners	San Diego	Alpine	May 2007

# Performance Evaluation

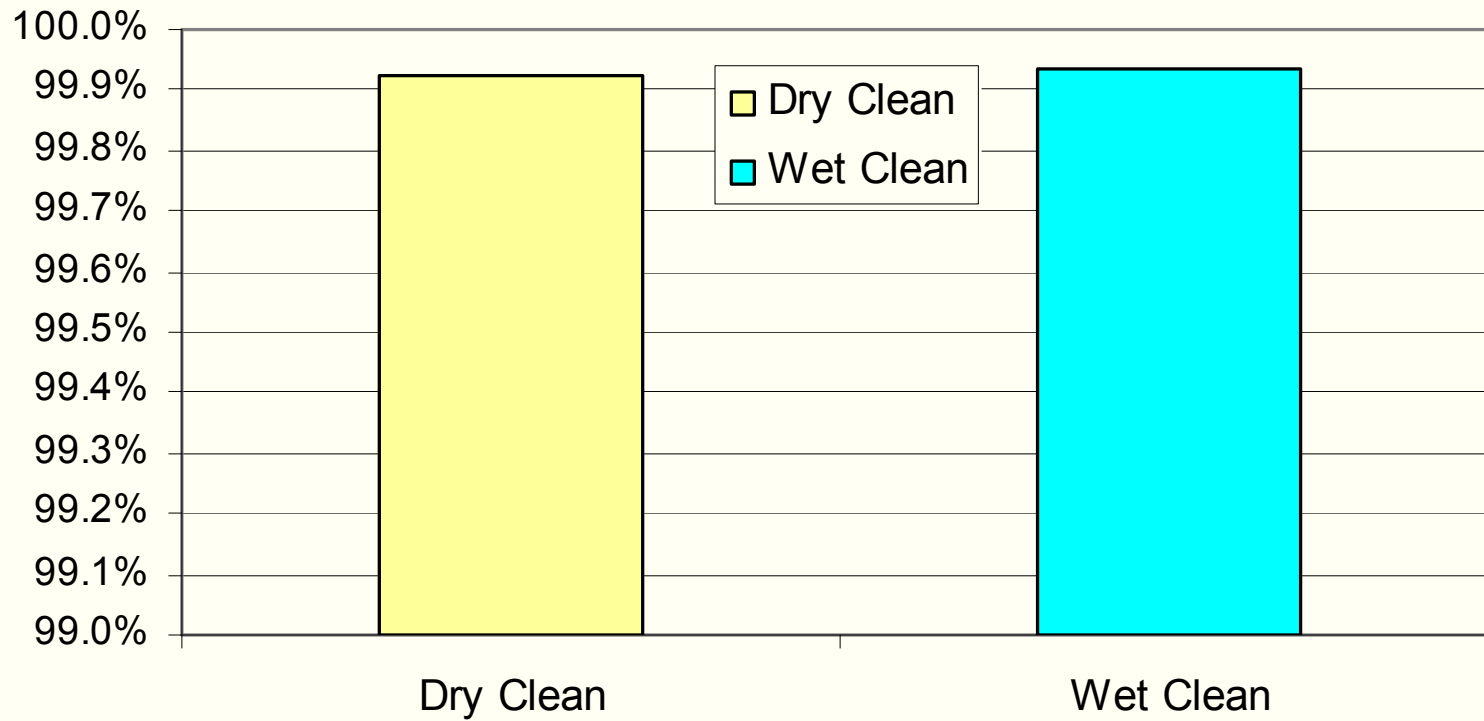
- Can cleaners effectively wet clean garments that they would have previously dry cleaned?



# Problem Garment Evaluation



# Overall Success Rate



# 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

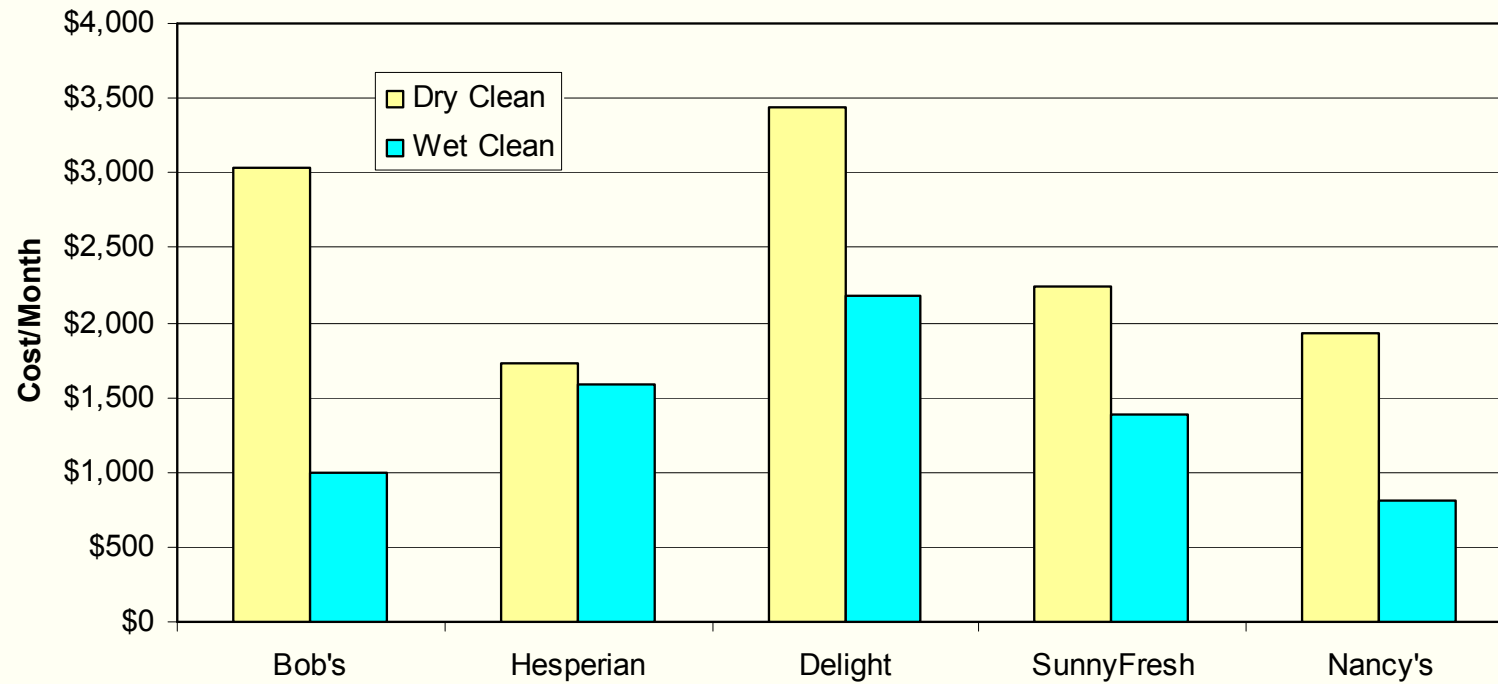
- Are capital and operating costs in professional wet cleaner comparable to a PERC dry cleaner?



# Capital Equipment Cost

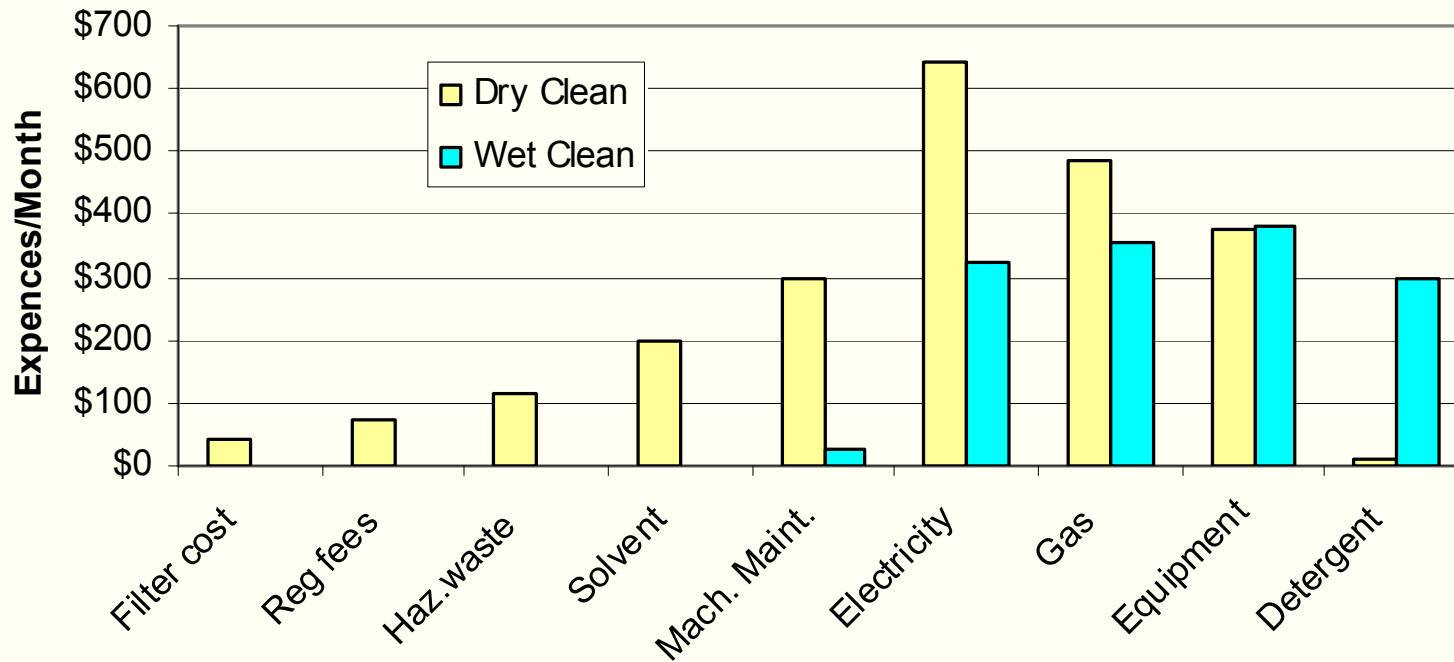
	<b>Dry Cleaning</b>	<b>Wet Cleaning</b>
<b>Washer/Dryer System</b>	\$50,000-\$65,000	\$15,000-\$35,000
<b>Tensioning Pants Topper</b>	NA	\$10,000-\$15,000
<b>Tensioning Form Finisher</b>	NA	\$10,000-\$15,000
<b>Total</b>	\$50,000-\$65,000	\$35,000-\$65,000

# Process-Dependent Operating Costs





# Process-Dependent Cost: Sunny Fresh Cleaners



# Labor Efficiency

	<b>Volume Increase/ Labor Same</b>	<b>Volume Increase/ Labor Increase</b>	<b>Volume Same/ Labor Same</b>
Bob's	√		
Hesperian		√	
Delight	√		
Sunny Fresh			√
Nancy's	√		

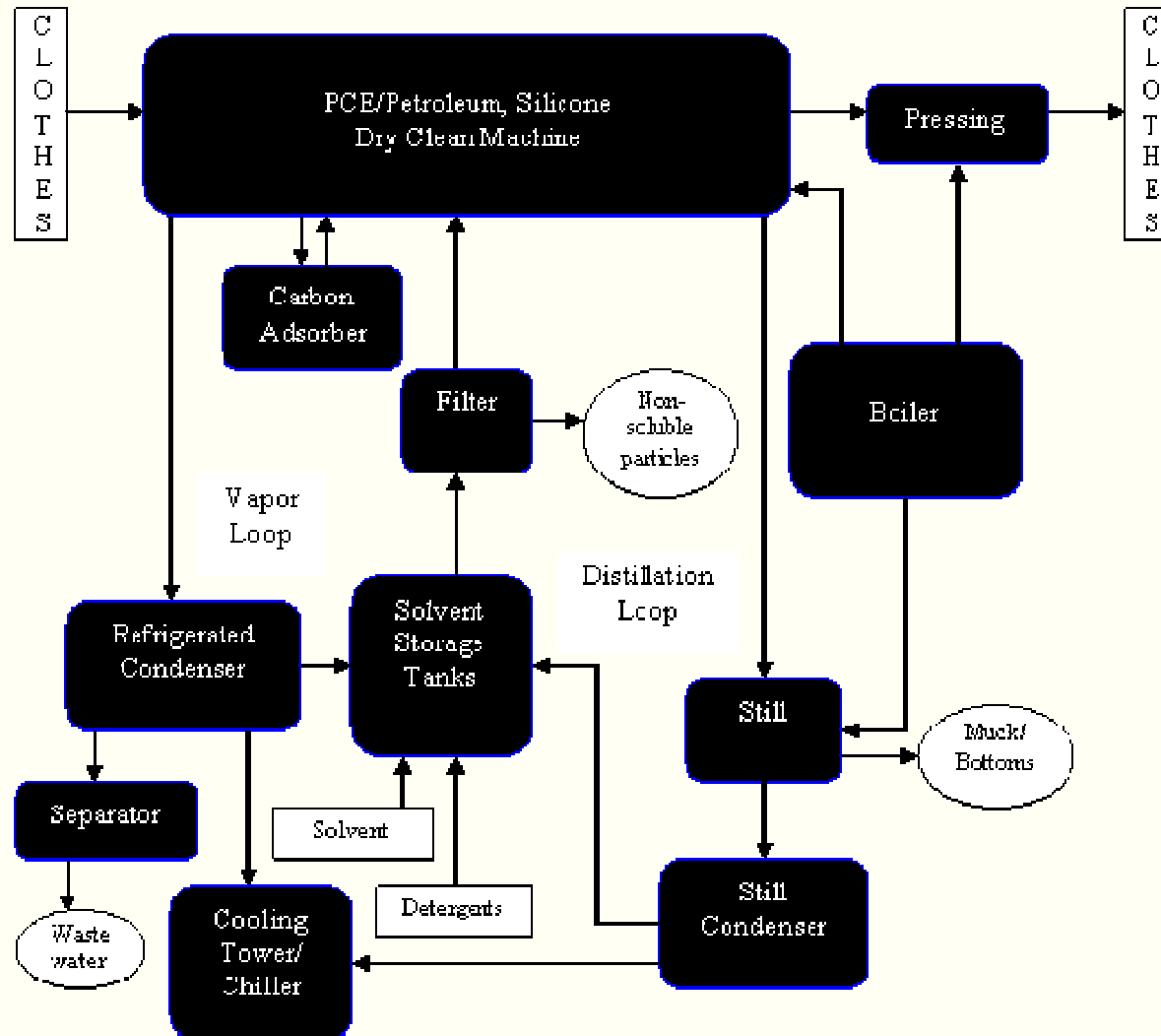
# Resource Use

- What are the impacts in energy and water use?

# Dry Clean Resource Use



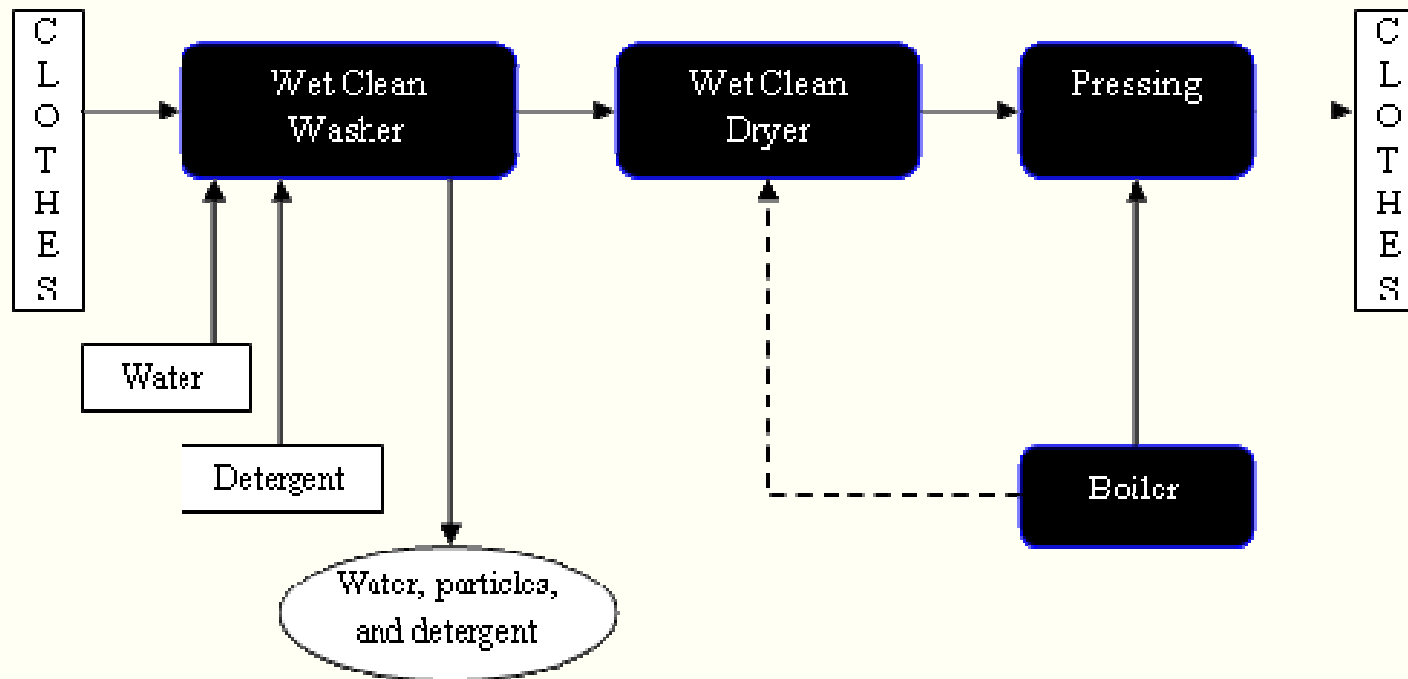
# Dry Cleaning Process



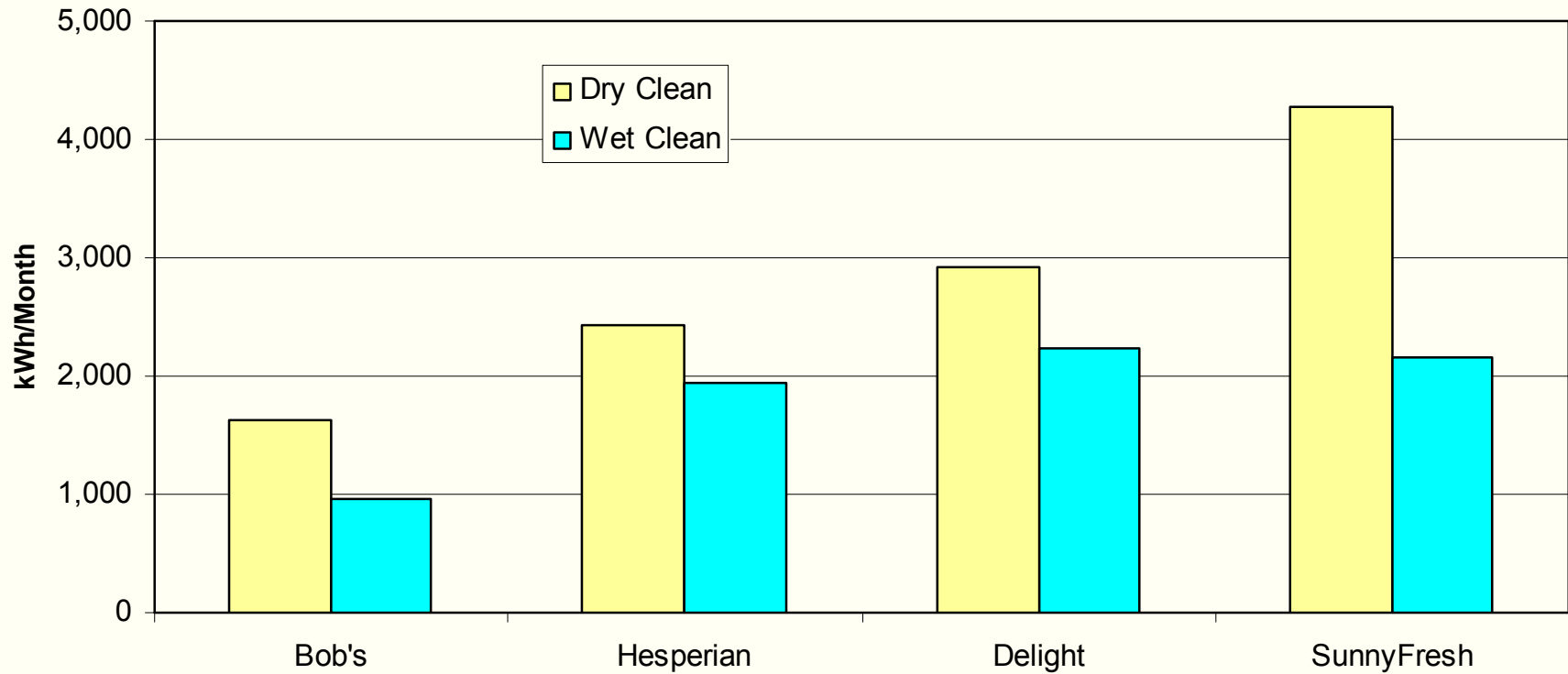
# Professional Wet Clean Resource Use



# Professional Wet Cleaning Process-Flow Chart

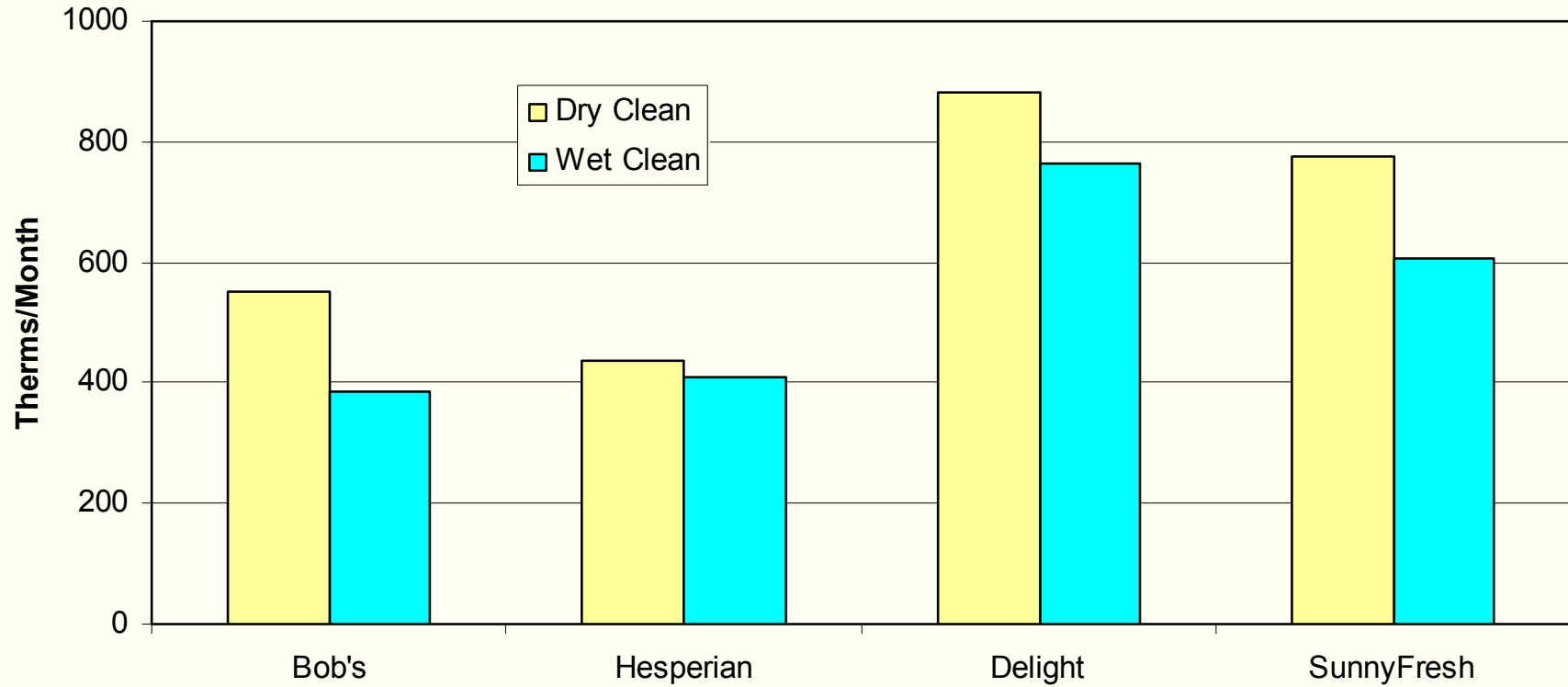


# Electricity Use kWh/Month

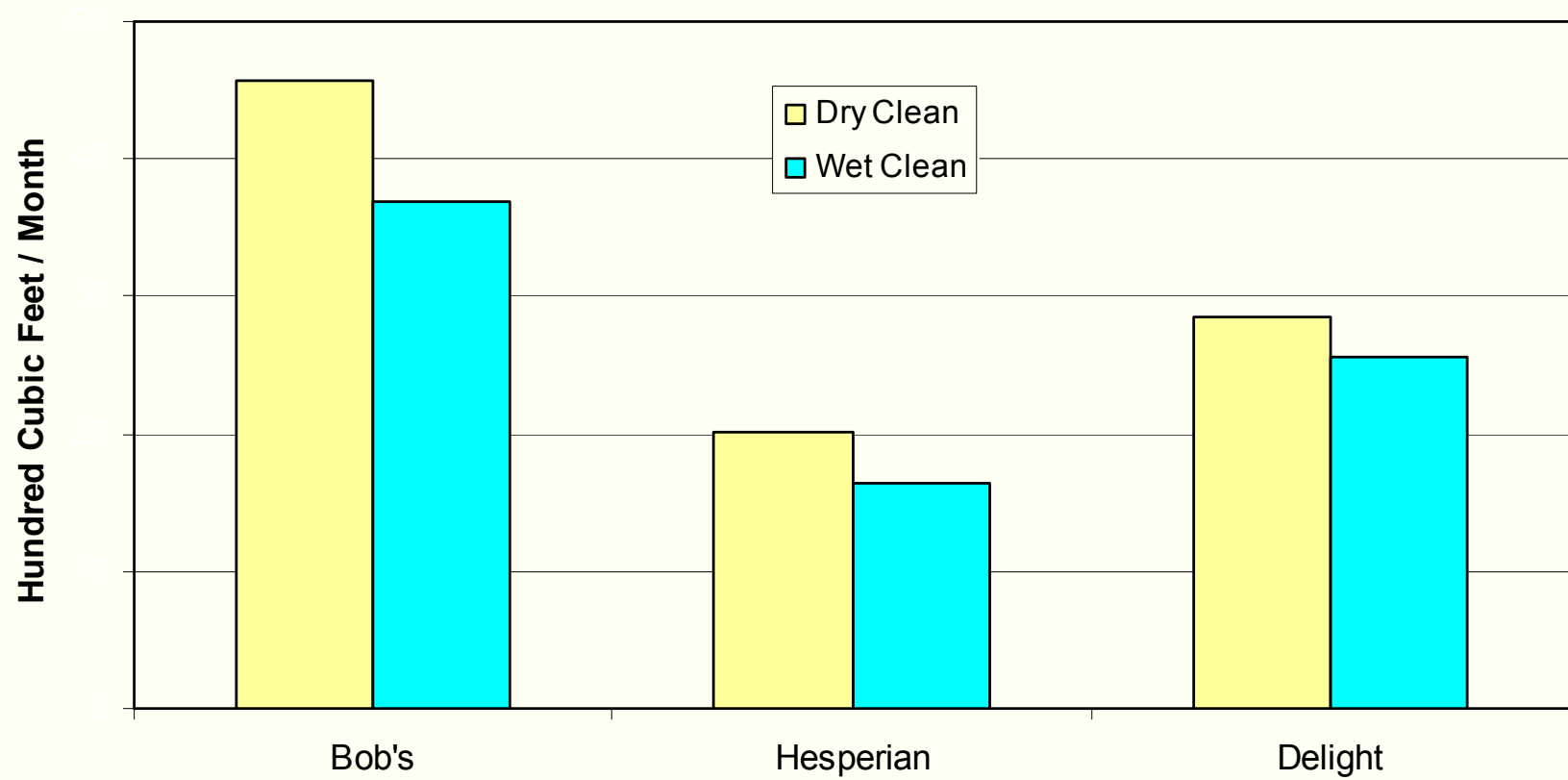




# Natural Gas Use Therms/Month



# Water Use



# Cleaners' Concerns About Switching to Wet Cleaning Technology

	<b>Poor Performance</b>	<b>Increased Cost</b>	<b>Customer Reaction</b>
Bob's	√		
Hesperian	√	√	√
Delight	√	√	
Sunny Fresh	√		
Nancy's	√		

# Biggest Difficulties in Making the Switch to Professional Wet Cleaning

	<b>Training/ Tech Support</b>	<b>Fear of Harming Garments</b>
Bob's		
Hesperian	√	√
Delight	√	√
Sunny Fresh	√	
Nancy's	√	

# Importance of training in making a successful transition

<b>Not at all Important</b>	<b>Not too Important</b>	<b>Somewhat Important</b>	<b>Very Important</b>
0	0	0	5

# Owner Satisfaction

	<b>Yes</b>	<b>No</b>
Switching was good business decision	5	0
Would recommend technology to other cleaners	5	0

# Symptoms Operating as PCE Dry Cleaner

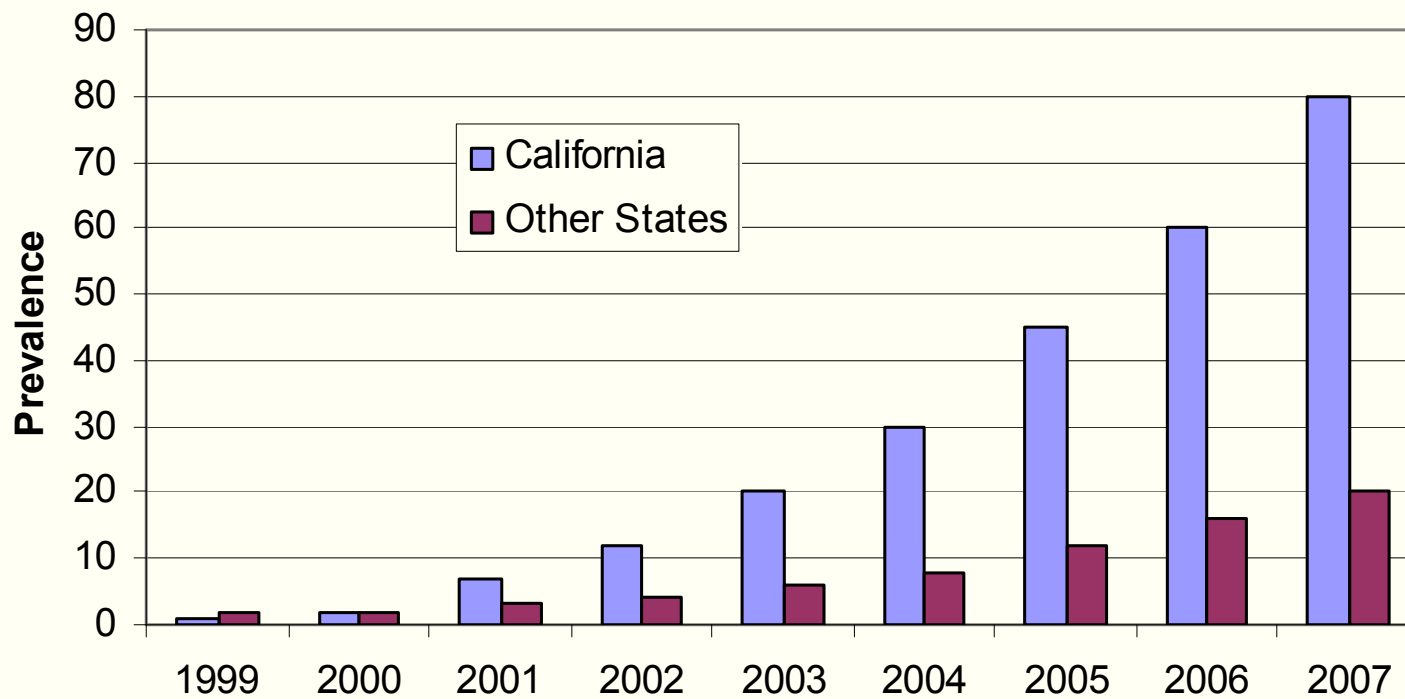
	Headache	Dizziness	Fatigue	Nausea	Nasal Irritation
Bob's	√				
Hesperian	√	√	√	√	√
Delight					√
Sunny Fresh	√	√		√	
Nancy's	√	√	√		

# Symptoms Operating as Professional Wet Cleaner

	Headache	Dizziness	Fatigue	Nausea	Nasal Irritation
Bob's					
Hesperian					√
Delight					
Sunny Fresh					
Nancy's					



# Growth of Dedicated Professional Wet Cleaning



# 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

	<ul style="list-style-type: none"><li>• PROFESSIONAL WET CLEANING</li><li>• NORMAL PROCESS</li></ul>
	<ul style="list-style-type: none"><li>• PROFESSIONAL WET CLEANING</li><li>• MILD PROCESS</li></ul>
	<ul style="list-style-type: none"><li>• PROFESSIONAL WET CLEANING</li><li>• VERY MILD PROCESS</li></ul>

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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