Toxics Use Reduction and Resource Conservation:
Competitiveness Impacts for Massachusetts Businesses

Massachusetts Toxics Use Reduction Institute (TURI) and
Massachusetts Office of Technical Assistance and Technology (OTA)

TURI
TOXICS USE REDUCTION INSTITUTE
UMASS LOWELL

OTA
OFFICE OF TECHNICAL ASSISTANCE & TECHNOLOGY

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Note about this slide deck

- This slide deck includes an assortment of slides, for use as a resource when you are developing a presentation. Please note in some cases there are two different slides for a single company, as we have presented the information in a variety of ways. Choose whichever one meets your needs.

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Dry Cleaners

- 5 sample dry cleaners that received assistance from TURI
- Small, family-owned businesses
- All shifted to 100% professional wet cleaning
- All achieved savings in operating costs
- Ten-year savings range from $28K to $375K

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Dry Cleaners

Table 1: Capital Investments, Savings, ROI and 15-year NPV at five garment cleaning facilities						
Facility	**Capital investment[b]**	**Savings - annual labor costs**	**Savings - monthly operating costs**	**Savings - monthly resource costs**	**ROI/ ROI discounted[d]**	**15 year NPV**
SH[a]	$51,880	$26	($432)[c]	$414	4.3/2.6	$136,725
Ace	$33,981	$5,835	$181	($81)[c]	2.6/1.4	$48,715
K&Q	$63,146	$5,134	$80	$86	1.0/0.3	$28,084
AB	$33,512	$2,053	$425	$429	5.3/3.3	$111,074
KMK	$38,151	$22,047	$683	$1,083	18.8/12.4	$474,577
Average					**5.7/3.6**	**$159,835**

[a] This facility experienced savings of about $1,400 per month on claims for damaged garments.
[b] These investments were offset by TURI grants of: $18,000, $17,000, $17,000, $8,500, and $15,000, respectively. However, the TURI grant is not factored into the calculation of ROI and NPV.
[c] Parentheses denote a cost increase.
[d] Discount rate set at 5%.

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Decorative chrome plating

- Columbia Manufacturing
  - Facility upgrade to reduce use of hexavalent chromium
  - Tripled plating capacity, increased competitiveness nationally
- Independent Plating
  - Installed trivalent plating line
  - Eliminated cyanide plating, reduced hydrochloric acid

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Semiconductor Manufacturing – Analog Devices

- Reduced energy use by more than 16 million KWH per year through conservation initiatives.
- Reduced water consumption by nearly 90 million gallons per year through water use conservation projects.

Paints & Coatings – Stainless Steel Coatings

- Reduced the use of xylene by 57 percent and eliminated the use of hexavalent chromium.
- Saved more than $15,000 per year in reduced waste disposal costs.
- Reduced hazardous waste generation by 52 percent.
- Reduced energy costs by 20 to 25 percent and saved 14,500 pounds of CO2 emissions per year.

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Independent Plating

- Reduced the use of toxic chemicals by more than 500,000 pounds, including:
  - Cyanide compounds by 95 percent
  - Hexavalent chromium compounds by 88 percent
  - Hydrofluoric acid by 100 percent
- Reduced the use of acids, bases and other reportable metal compounds.
- Made the switch from hexavalent chromium to trivalent chromium on several production lines, with assistance from a TURI incentive grant.

Analog Devices

- Reduced energy use by more than 16 million KWH per year through conservation initiatives.
- Reduced water consumption by nearly 90 million gallons per year through water use conservation projects.
- Reduced the use of sodium hydroxide and hydrochloric acid for resin regeneration in deionized water production processes.
- Newsweek magazine ranked Analog Devices as among the top 50 greenest companies in the United States in 2014.

Siemens Healthineers

- **Stratus® CS Analyzer:** Provides quantitative cardiac assays for fast, accurate testing of patients with suspected myocardial ischemia (reduced blood flow to the heart).
- Contains a chemical in the family of octylphenol ethoxylates (OPEs), used as a surfactant.
- OPEs have been identified as a Substance of Very High Concern (SVHC) under REACH.
- Siemens Healthineers requested TURI's assistance in identifying a surfactant that would work as well as the OPEs for its specific applications in medical diagnostics.
- TURI provided funding to support a partnership between Siemens Healthineers and a researcher at the University of Massachusetts Lowell.
- Working together, the team was able to identify an alternative with equally good technical performance. The team is now conducting further testing to assess health & environmental impacts.

Chemgenes Corporation

- Reduced the use of chloroform by more than 55 percent and hexane by more than 35 percent.
- Improved manufacturing efficiency, saving $215,000 in chemical purchases, regulatory fees and disposal costs.
- Reduced solid waste from 25,000 to 8,000 lbs. per year.
- Anticipates reducing the use of hexane and ethyl acetate by 27,000 lbs., or 70 percent annually, through the installation of a new solvent recovery and recycling system, purchased with help from a TURI incentive grant.

Auto shops

Table 9: Annual savings at two auto shops		
Facility	**Annual savings**	**Other business factors**
Mike's Auto Body	$1,371	• Facility undertook several TUR initiatives. Some increased costs and others yielded savings. Taken together, they yielded net annual savings.
912 Auto Center	$3,357	• Facility made a capital investment of $60,000 in a new spray booth associated with its move to a new location. • Worker/owner experienced direct health benefits.

Auto shops: 912 Auto Center

Table 8: Investments, costs and savings at 912 Auto Center			
Product	**Capital investment**	**Annual savings**	**Other business factors**
Water-based paints	n/a	No change in costs	• Eliminating paint reducer counterbalanced increased cost of the water-based paints. • Worker/owner no longer experiences dizziness while mixing paints.
Water-based gun washing solution	$1,000	$3,357	• Capital investment was optional; water-based system could also have been used with existing equipment. • Water-based system works more quickly (one wash instead of several washes).
Spray booth	$60,000	n/a	• New booth was necessary due to move to new facility; new booth also facilitated use of water-based paints.

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912 Auto Center

912 Auto Center Owner, Larry Dossantos with Herkules paint gun washer containing Acrastrip®)

- Water-based paints
  - No change in costs (eliminating paint reducer counterbalanced cost for water-based paints)
  - Worker/owner no longer experiences dizziness when mixing paints
- Water-based gun washing solution
  - Capital investment of $1,000 (optional – could have used existing equipment)
  - Annual operating cost savings: $3,357
  - Works more quickly than solvent-based system
- Spray booth
  - $60,000 capital investment
  - New booth was necessary due to move to new facility; also facilitated use of water-based paints

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