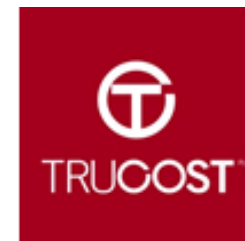




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Making the Business & Economic Case for Safer Chemistry

Report for the American Sustainable Business Council and Green Chemistry & Commerce Council

December 8, 2015

Dr. James Salo
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Agenda



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1. About Trucost
2. Research objectives & themes
3. Research themes & key findings
4. Recommendations

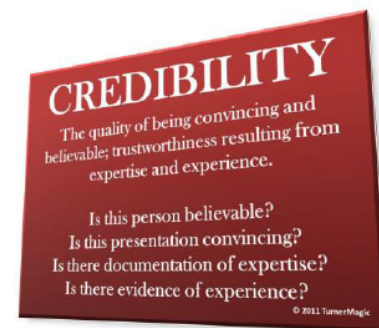
About Trucost



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Since 2000, Trucost has provided data driven insights to help businesses and investors understand the economic case for investing in more sustainable business models.



Our presence and point of view is international, and our work spans a wide range of industry sectors, supply chains and sustainability issues. We use best available tools and datasets that are “fit for purpose”. Our clients reap the benefit with creative and innovative applications of existing methodologies.

Recent examples include:

- [Natural Capital Leaders](#)
- [Valuing Plastics](#)
- [NovoNordisk – a new lens on profit and loss](#)

Clients rely on us for science-based, data driven insights to support their claims, but also value our expertise in creating compelling stories that engage stakeholders. We are experienced helping our clients demonstrate their leadership on high profile projects extensively scrutinized by NGOs and media.

Examples where we have supported our clients in achieving “first to market” recognition for their leadership

- [Puma EP&L](#)
- [EA Stranded Asset Analysis](#)
- [Sprint Supply Chain Footprint](#)
- [Top 100 Externalities of Business](#)

Our research is highly regarded; as a third party with whose expertise is in quantifying environmental performance, the Councils can confidently rely on the study results to support external communications. Our multidisciplinary team has expertise in finance, environmental economics, chemistry, natural resource management and engineering

- The [UK government](#) selected Trucost to write its environmental reporting standards.
- The [Cradle to Cradle Institute](#) selected Trucost to develop a framework to evaluate the economic case for material substitution and more sustainable product design.

Research Objective



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Document the value of safer chemistry, looking at both risks and opportunities for businesses and economies.

Research Themes



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	Theme	
Opportunities	1. Market growth	What are the growth rates of safer chemistry markets compared to conventional markets?
	2. Trends in capital flows	What has been the increase in capital flows toward business with safer chemistry initiatives?
	3. Market demand	Have safer chemistry related procurement policies been adopted over time?
	4. Job growth	What are the trends in job creation related to safer chemicals?
Risks	5. Shareholder and NGO activism	What has been the trend in shareholder proxies and NGO activist campaigns related to safer chemicals?
	6. Chemical restrictions	How have chemical restrictions been increasing over time?
	7. Business value at risk	What are examples of compelling events, business disruptions, profit warnings, revenue losses or increased operating expenses related to chemical issues?
	8. Societal costs of accidents and incidents	What are the top examples of situations where communities have incurred significant environmental and societal costs related to chemical issues?

Research Approach

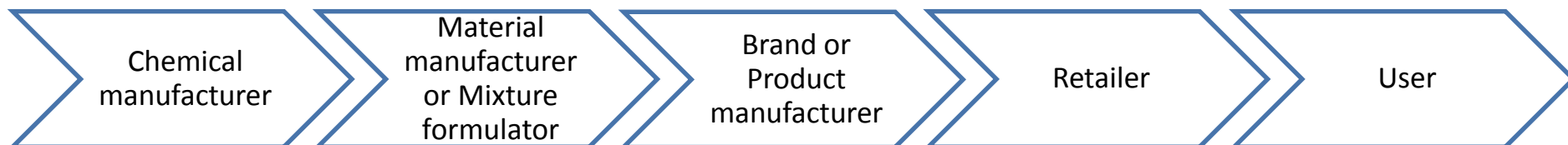


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Scope

- Interview with 17 experts in adopting safer chemistry practices
- Review of available public literature
- Identification of US-based examples across the chemical value chain



The research intent was to explore risks and opportunities from a value chain perspective, spanning from chemical manufacturing through formulator, retailer and end user. We also attempted to incorporate the views of representatives from a number of market segments, such as apparel, electronics and personal care, as well as perspectives from both small and large businesses

Key Findings



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1. Safer chemistry's potential for creating business & economic value: promising & poised for takeoff



2. Upward trajectory: market growth, capital flows & market demand



3. Business risks: expanding regulations, NGO & shareholder activism, loss of access to major markets, & chemical mismanagement

Key Findings



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Theme 1: Market Growth

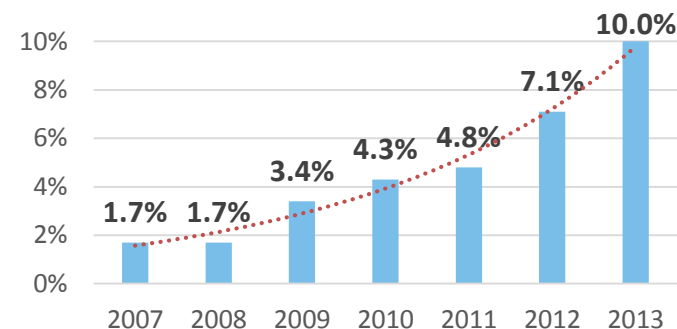
Growth Rates of Safer Chemistry vs Conventional Market

Sector	Safer Chemistry Market	Conv. Market	Time Period
Building Materials	+2000% ¹	+176% ²	2009-2030
Chemistry	+3200% ³	+133% ³	2011-2020
Personal Care	+10.12% CAGR (US) ⁴	+4.43% CAGR (global) ⁵	2012-2016
Cleaning Products	+20% CAGR ⁶	+1.5% CAGR ⁷	2007-2011

“We have seen 6-10% annual growth in the natural products sector, compared to near-zero growth for conventional products.”

—Martin Wolf, Director, Sustainability & Authenticity, Seventh Generation

Sales “Highly Advantaged” by Sustainable Chemistry¹⁶



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Theme 2: Trends in Capital Flow

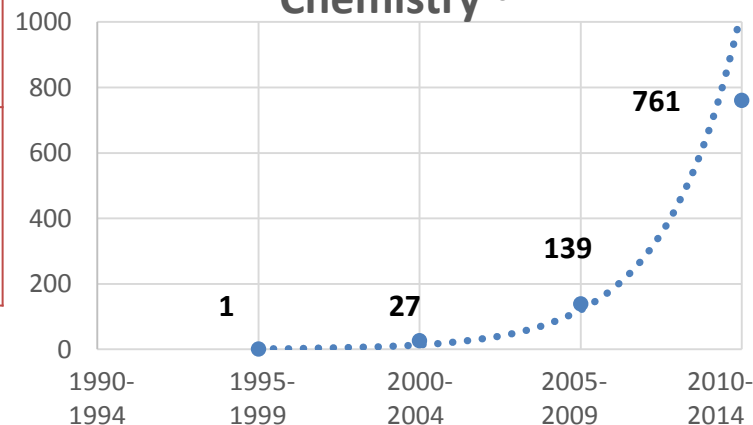
Investments in Safer Chemistry

Sector	Investment Type	Investment in Safer Chemistry	Time Period
Chemicals	Safer Chemistry R&D	57% of chemical companies in MSCI World Index invested in green chemistry R&D ¹⁷	2013
Chemicals	Safer Chemistry R&D	11-15% of average chemistry company's R&D budget ¹⁸	2011
Building Materials	Research Grant	\$3 million for USGBC research of health hazards, from Google ¹⁹	2013
Advanced Materials	Investment (Various)	\$4.9 billion invested in advanced materials industry; can help drive green chemistry ²⁰	2002-2013

*"55% of members believe the ROI of green chemistry R&D is greater than for standard investments."*²⁵

– American Chemistry Society (2013 survey)

US Patents Issued for Sustainable Chemistry²⁶



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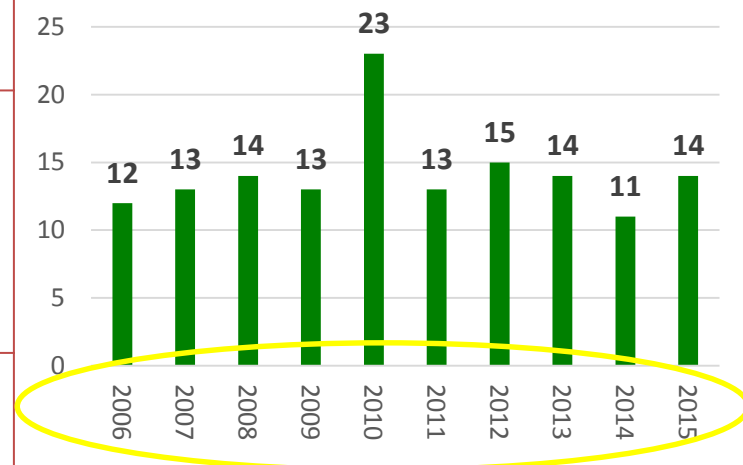
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Theme 5: Shareholder and NGO Activism

Actions by Shareholders or NGOs

Sector	Pre-2005	2006 – 2008	2010 – 2012	2013 – Present
Personal Care—Cosmetics	NGO testing: 70% of personal care products are positive for phthalates ⁴⁹	Campaign for Safe Cosmetics started to remove hazardous chemicals; 175 organizations today Campaign pushes nail polish brands to remove “toxic trio” ⁵⁰	322 companies pledge to avoid specific chemicals and disclose ingredients ⁵¹	<i>Cosmetics Without Cancer</i> launched in 2014 ⁵² 50,000 sign petition for Revlon to stop using cancer-causing chemicals ⁵³
Health Care	Health Care Without Harm started in 1996 ⁵⁴ <i>Green Guide for Health Care</i> for facility design; 293 projects ⁵⁵	90% of purchasers of \$1.6B sterile medical packaging commit to remove phthalates ⁵⁶ Launch of <i>Guide to Choosing Safer Products & Chemicals</i> ⁵⁷	\$135B purchasing replies to Practice Greenhealth supplier queries, for 7,148 partner facilities ^{58, 59}	
Apparel			Greenpeace <i>Detox</i> campaign targets apparel brands ⁶⁰	Adidas and Puma agree to remove PFCs (PFC textiles: \$1.73B by 2020) ^{61, 62}
Retail	17 investor groups with \$22B in assets call for disclosing capital risk from toxics ⁶³	22% of Bed, Bath & Beyond investors vote for chemical reporting ⁶⁴	NGO testing: 39% of discount stores’ PVC packaging has cadmium or lead above state laws ⁶⁵	NGO testing: 32% of dollar stores’ PVC products have phthalates above CPSC limits ⁶⁶
Flame Retardants—Electronics, Furniture & Baby Products	NGO issues first US report on PDBE flame retardants in household dust ⁶⁷	Apple shareholder resolution pushes for eliminating PBTs including BFRs ⁶⁸	Study links firefighters’ exposure and cancer risk ⁶⁹	Coalition of groups petition CPSC to ban products with toxic flame retardants ⁷⁰

Shareholder Resolutions on Hazardous Chemicals⁷²



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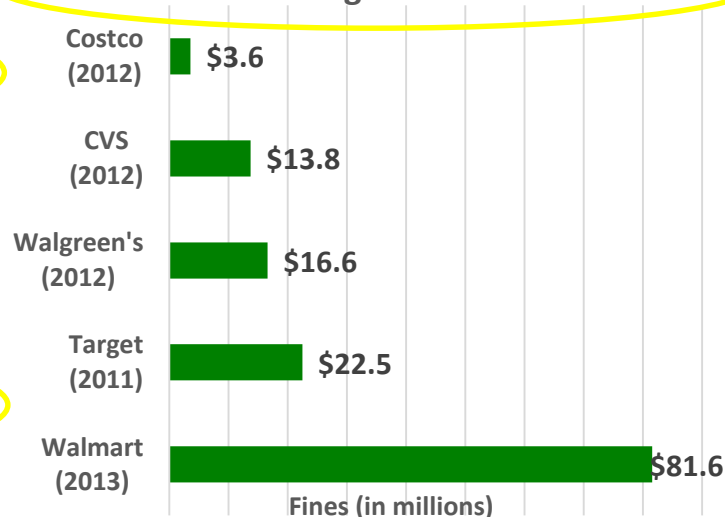
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Theme 7: Business Value at Risk

Impacts on Business Value

Sector	Business Value at Risk	Impact	Time Period
All	Federal Enforcement	\$9.7 billion in private industry cleanup actions and equipment, along with \$163 million in fines ⁸⁶	2014
All	Tort Settlements	\$17 million in settlements for violating California Prop 65 ⁸⁷	2013
Consumer Products	Lawsuits	25 lawsuits filed against companies using BPA in their products ⁸⁸	2009-2010
Beauty & Personal Care	Market Share	-8.4% in market share of Johnson & Johnson due to consumer concern about ingredients ⁸⁹	2008-2010
Toys	Shareholder Value	-25% stock price of RC2 from lead-painted toys ⁹⁰	2007
Health Care	Market Share	Existing vendor lost \$70 million contract because it could not provide PVC/DEHP-free medical products ⁹¹	2005-2010
Chemicals	Market Value	\$200 billion (or 31% of assets' value) due to lawsuits and toxic releases ⁹²	2001
Chemicals	Regulatory Fines	\$16.5 million of DuPont for Teflon® pollution; faced class-action lawsuits ⁹³	2005-2008

Fines for Mishandling Hazardous Chemicals⁹⁴



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Theme 3: Market Demand

Increased Demand for Safer Chemistry

Sector	Buyer	Purchasing of Safer Chemistry Products	Time Period
Retail	Walmart (\$476B in revenue) ²⁷	Vendor disclosure of priority chemicals and certification of private brands as USEPA DFE ²⁸	2014-2018
Retail	Target (\$72B in revenue) ²⁹	Chemicals are the most important sustainability issue for Target's customers ³⁰	2014
Retail	Staples (\$23B in revenue) ³¹	Corporate customer—who represent 50% of revenue—have increased demand for safer chemistry products ³²	2014
Retail	Various	+500% sales of BPA-free baby bottles ³³	2008
Health Care	Group Purchasing Organizations (\$135M in medical product purchasing)	Adoption of standardized questionnaire; top-rated product attributes include being free of heavy metals, persistent synthetic chemicals and PVC ³⁴	2014
Furniture	Ashley Furniture	Toxic flame retardants no longer added to foam cushions (largest US furniture retailer) ³⁵	2015
Public	Federal Agencies	95% of new contracting must include sustainability requirements, such as non-toxic or less toxic materials ³⁶	2009-Present
Public	Federal Agencies (\$50B in annual purchasing)	GSA requires buying a product with reduced health or environmental effects that serves the same purpose ³⁷	2013

Recommendations



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- 1. Businesses that have not yet evaluated their individual business case for safer chemistry within their specific product portfolio and market segment are strongly encouraged to do so, given the potential for revenue growth and business value at risk.**
- 2. Metrics that relate to business and economic opportunity (and risk) should be tracked and communicated, to help spur business understanding of safer chemistry and public policy mechanisms for data disclosure.**
- 3. The total societal benefits associated with the total addressable market for safer chemistry should be quantified and communicated to policy maker and investors.**
- 4. Existing safer chemistry initiatives should be catalyzed, harmonized and aligned through a value chain approach and used to leverage capital flows toward safer chemistry innovation.**
- 5. Stakeholders should work toward a common understanding and communicate with clarify on the specific aspects of safer chemistry that they are addressing, since the topic can encompass many different production aspects and product attributes.**
- 6. Priorities for filling data gaps should include gathering more specific market research to quantify the potential for job growth and revenue opportunity for safer chemistry (as more narrowly defined), more specifically by product segment and industry vertical.**

Questions?



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