SUSTAINABILITY – VISION 2020
- NEW CHALLENGES FOR
TEXTILE INDUSTRY

ALOK KUMAR SHARMA

RAMKUMAR MILLS PVT. LTD.

8 May 2015
NEW SERIOUS CHALLENGES
- WATER FOOTPRINT

It takes 13 gallons of water to dye 1 lb of cotton.²
That’s 2 weeks’ worth of drinking water for a mother and her child.³

NEW SERIOUS CHALLENGES
- WATER FOOT PRINT
NEW SERIOUS CHALLENGES
- WATER FOOT PRINT

Relative World Water Supply

If the total water supply is represented by 100 liters or 26 gallons, then relative amounts are as follows:

Total Water =
Sea/salt water + Fresh water

26 gallons = 100%

- Fresh water
- Avail. fresh water
- Usable fresh water

0.8 gal = 3%  
0.5 quart = 0.5%  
0.5 teaspoon = 0.003%
NEW SERIOUS CHALLENGES - WATER FOOTPRINT

Global water demand: Baseline scenario, 2000 and 2050

Source: OECD
NEW SERIOUS CHALLENGES - CARBON FOOTPRINT
30 million tons of cotton are produced annually. To dye it all using the current dyeing process would require enough energy to power New York City for 21 years.
SERIOUS CHALLENGES FACED BY TEXTILE PROCESSING

Life Cycle Inventory

Input
- Chemistry: 200 kg
- Packaging: 25 kg
- Raw Fabric: 1100 kg
- Water: 100,000 kg
- Energy: 44 GJ
  - Process: 40 GJ
  - Transport: 2 GJ
  - BMR: 2 GJ

Recycling: less than 100 kg

Raw Materials
- Treatment
- Elaboration
- Distribution
- Use
- Elimination

Output
- Waste
  - Earth: 183 kg
  - Water: 38,000 kg
  - Sludge: 127 kg
  - Packaging: 26 kg
  - Fabrics: 23 kg
  - Chemicals: 7 kg

Overview of LCI expressed as kg/1000 kg fabric
NEW SERIOUS CHALLENGES - EFFLUENT DISCHARGE
NEW SERIOUS CHALLENGES - EFFLUENT DISCHARGE

“The river water smells here – you can’t even use it for bathing, or else you’ll itch and break out in little red spots all over your body. Don’t even think about drinking this stuff.”

- Xie Chunlin, a local fisherman at Yanglingang, Fuqiao, in Taicang

“You know the color that’s in fashion this season by the color of the rivers. In my work in China, I’ve seen rivers of every color.”

- Linda Greer, PhD, Senior Scientist, Natural Resources Defense Council
NEW SERIOUS CHALLENGES
- EFFLUENT DISCHARGE

“Half the world’s hospital beds are occupied by patients suffering from waterborne diseases”
- blueplanetnetwork.org

There is a growing water crisis in the world. Water pollution from cotton dyeing intensifies this, especially in the small towns and villages where water is a rare and valuable commodity.
NEW SERIOUS CHALLENGES
- EFFLUENT DISCHARGE

According to the World Bank:

20% of Industrial Fresh Water Pollution comes from textile treatment and dyeing.
VISION 2020 – ZDHC

ZERO DISCHARGE of HAZARDEOUS CHEMICALS

1. Dirty Laundry

Date: Jul 2011
Case: Unraveling the corporate connections to toxic pollution in China
Methodology: Waste Water testing
Key point: Greenpeace (GP) uncovered links between the Younger Group (found to be discharging toxic chemicals) and a number of major clothing, fashion and sportswear brands including H&M, Puma and G-Star.
VISION 2020 – ZDHC

ZERO DISCHARGE of HAZARDEOUS CHEMICALS

GREENPEACE’S CAMPAIGN OVERVIEW
NEW SERIOUS CHALLENGES - EFFLUENT DISCHARGE

Clothing and the global toxic cycle

1) Formulations containing nonylphenol ethoxylates (NPEs) and other chemicals are delivered to textile manufacturers for use as surfactants.

2) Lax regulation permits wastewater discharges of NPEs which break down into persistent, bioaccumulative and hormone-disrupting nonylphenols (NPs) in rivers.

3) NPs accumulate in sediments and can build up in the food chain, such as in fish.

4) Global exports deliver clothing containing residual levels of NPEs to markets even where these chemicals are banned in clothing manufacture.

5) Washing releases NPEs to water treatment facilities.

6) Water treatment is generally ineffective in dealing with NPEs, essentially only speeding up their breakdown to toxic NPs.

7) Hormone-disrupting NPs end up in aquatic systems even in countries where use of the parent compounds (NPEs) is banned.
‘These hazardous chemicals pose long-term threats to human health and the environment. What makes many of these chemicals so dangerous is that they do not only persistent (meaning that they do not readily break down in the environment), but also bio accumulative (meaning that they can build up in the food chain and can have serious, long-term effects on the organisms that ingest them). Some are able to interfere with hormone systems in people and wildlife, even at very low doses, while others are carcinogenic or reprotoxic.’

p.6 Dirty Laundry, Greenpeace
What is ZDHC Programme?

- ZDHC is a very ambitious and challenging goal.
- A plan that makes change for the Apparel and Footwear industry.
- The programme is owned and led by the Signatory Members.
- The goal ‘ZDHC by 2020’ requires the participation and support of the entire industry.
The ZDHC Programme

In 2011, the Zero Discharge of Hazardous Chemicals (ZDHC) Programme formed to catalyse positive change in the discharge of hazardous chemicals across the product life cycle. The coalition now includes brand members adidas Group, C&A, Esprit, G-Star Raw, H&M, Inditex, Jack Wolfskin, Levi Strauss & Co., Li Ning, M&S, New Balance Athletic Shoe, Inc., NIKE, Inc., and PUMA SE, a growing number of associate members, and a diverse group of stakeholders. Given the challenge of driving industry change, program aims to succeed in achieving the vision and goals of the ZDHC Joint Roadmap, if all the members work together. This is the true origin of the ZDHC collaboration.

The Joint Roadmap is a highly ambitious plan that aims to set a new standard of environmental performance for the global apparel and footwear industry.
ZDHC Vision
We envision an apparel and footwear industry that delivers high quality products, using safe chemistries, operating in ways that keep communities free from unintended, downstream environmental impacts. Further, our vision includes delivery to a market in which sustainable chemistry practices are preferred and rewarded, and the entire system of suppliers, brands, governments and NGOs also will fulfill their responsibilities to ensure the safe use of chemicals.

ZDHC Mission
The ZDHC Programme and its multi-stakeholder group of partners will transform the global apparel and footwear industry by improving environmental performance and chemical safety; thereby delivering a safer and cleaner environment as we work towards zero discharge of hazardous chemicals in the life cycle of all products by 2020.
ZDHC 2020 Goals: The ZDHC Programme is working towards achieving the following goals by 2020:

1. Elimination or substitution of hazardous chemicals in our members’ products and their manufacture
2. Development of a transparent process to screen and eliminate hazardous chemicals in the apparel and footwear industry
3. Tools training and capacity building programmes in place to support the entire supply chain
4. Development of common, harmonised assessment tools to be used throughout the industry and clear guidelines on best practices available for all supply chain stakeholders
5. Development of a system of disclosure created in partnership with the supply chain, that allows communities and consumers to access information about potential exposures to chemicals
6. The entire system of suppliers, brands, governments, and NGOs is engaged and participating, innovating, and fulfilling their respective responsibilities to ensure the safe use of chemicals.
7. Development of a transparent and continuous stakeholder engagement process, that helps build trust and ensures strong alignment amongst all parties.
VISION 2020 – ZDHC

ZERO DISCHARGE of HAZARDEOUS CHEMICALS

HOW TO ACHIEVE GOALS?

1. Understand how to achieve the goal for the industry
2. Work collaboratively with the industry and stakeholders towards the goal
3. Achieve the goal by 2020!

Joint Roadmap ver 2.0 Published June 2013
H&M’S COMMITMENT TOWARDS ZDHC

To lead the apparel and footwear industry towards ZDHC for all products across all pathways by 2020

Additional points:
- We commit to a more transparent chemical management, including inventorising of hazardous chemicals used and released across the supply chain.
- We will increase the public availability and transparency of our restricted substance list and audit process and will set up public disclosure of discharges of hazardous chemicals in our supply chain.
**11 PRIORITY CHEMICALS:**

1. APs & APEOs
2. Azo Dyes
3. Brominated and Chlorinated Flame Retardants
4. Chlorinated solvents
5. Chlorobenzenes
6. Chlorophenols
7. Organotin
8. Phthalates
9. SCCPs
10. Total heavy metals
11. PFCs

**WHERE**

- Bangladesh
- China
- India

**NUMBER OF FACTORIES**

- 5 in Bangladesh
- 3 in China
- 3 in India

**RESULTS** (Report is available online at hm.com)

- 11 Chemicals Verified
- 5 Found at Discharge
- 4 others are from manufacturing processes
- Indication based on Snapshot Chlorobenzene from incoming water
- Some wastewater results meet drinking water legislations
- All discharge data meet local wastewater legislations

---

1. Based on Available Data
2. Based on Available Data
3. Based on Available Data
4. Local meaning where the water was tested; Bangladesh, China and India
In the Zero Discharge of Hazardous Chemicals (ZDHC) Joint Roadmap, Version 2, ZDHC member brands committed to define and develop a Manufacturing Restricted Substances List (MRSL) for the apparel and footwear industry. The MRSL addresses hazardous substances potentially used and discharged into the environment during manufacturing and related processes, not just those substances that could be present in finished products.

This List was published by ZDHC Joint Roadmap group in October 2014.
In the Zero Discharge of Hazardous Chemicals (ZDHC) Joint Roadmap, Version 2, ZDHC member brands committed to define and develop a Manufacturing Restricted Substances List (MRSL) for the apparel and footwear industry. The MRSL addresses hazardous substances potentially used and discharged into the environment during manufacturing and related processes, not just those substances that could be present in finished products.

This List was published by ZDHC Joint Roadmap group in October 2014.

The ZDHC MRSL includes relevant substances from the original 11 priority chemical groups in the Joint Roadmap along with additional substances discussed with qualified experts from the ZDHC Technical Advisory Committee (TAC) and member brands. Several of the listed substances are regulated in finished products and have been successfully restricted by brands for years. Their inclusion on the list is consistent with existing industry standards.
<table>
<thead>
<tr>
<th>Chemical Classes</th>
<th>Typical Uses in the Textile Industry</th>
<th>Specific Process Where Class of Chemical is Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkylphenol Ethoxylates/Alkylphenols (APEOs/APEs)</td>
<td>Cleaners, detergents, sizing agents</td>
<td>Desizing, scouring, washing, dyeing, softening</td>
</tr>
<tr>
<td>Halogenated Flame Retardants</td>
<td>Flame retardants</td>
<td>Functional finishing</td>
</tr>
<tr>
<td>Chlorinated (Halogenated) Solvents</td>
<td>Spot cleaners, dry cleaning, scouring agents</td>
<td>Sizing, dry cleaning, scouring</td>
</tr>
<tr>
<td>Chlorinated Benzenes</td>
<td>Solvents, fiber swelling agents</td>
<td>Dyeing</td>
</tr>
<tr>
<td>Chlorophenols</td>
<td>Textile preservatives, pesticides</td>
<td>Pest control, sizing, dyeing, preservation</td>
</tr>
<tr>
<td>Heavy Metals</td>
<td>Dyes, pigments, catalyst</td>
<td>Fiber polymerising, dyeing, printing, tanning</td>
</tr>
<tr>
<td>Organotin Compounds (e.g., TBT)</td>
<td>Antimicrobial agents, preservatives, catalysts</td>
<td>Dyeing, leathering coating, pu synthesising</td>
</tr>
<tr>
<td>Per- and poly-fluorinated chemicals</td>
<td>Durable water repellents and their by-products</td>
<td>Functional finishing (water/oil repellent)</td>
</tr>
<tr>
<td>Ortho-phthalates</td>
<td>Plasticiser</td>
<td>Dyeing, printing, coating, softening</td>
</tr>
<tr>
<td>Short-Chained Chlorinated Paraffins</td>
<td>Leather conditioning</td>
<td>Tanning</td>
</tr>
<tr>
<td>Azo dyes that may release carcinogenic amines as defined in Annex XVII of REACH</td>
<td>By-product of banned dyes</td>
<td>Dyeing, printing</td>
</tr>
</tbody>
</table>

1 The Joint Roadmap specifically stated the ZDHC members would “Benchmark and verify whether the nine classes of chemicals...are in discharge to water or sludge through a carefully designed process of on-site visits and audits, inventories and analytics where appropriate... Data would also be collected on the use and discharge of Alkylphenol ethoxylates (APEOs) and Perfluorinated Chemicals (PFCs).”
How does the MRSL differ from a Restricted Substances List (RSL)?

A typical brand RSL sets concentration limits for substances in materials or finished products to comply with product regulation and safety standards.

The MRSL establishes guidelines for concentration limits for substances in different chemical formulations used within manufacturing facilities.
MRSL - Manufacturing Restricted Substances List

ZDHC MRSL mainly talks about 2 groups of substances:

**Group A: Raw Material and Finished Product Supplier Guidance**
Substances are banned from intentional use in facilities that process raw materials and manufacture finished products.
For e.g. Alkylphenol Ethoxylates / Alkylphenols (APEO/AP); Chlorinated Aromatic Hydrocarbons, Chlorinated Bleaching Agents & Chlorinated Organic Solvents, should not be present on the workplace as per H&M MRSL.

**Group B: Chemical Supplier Formulation Limit**
• Substances are restricted to concentration limits in chemical formulations commercially available from chemical suppliers. These limits ban intentional use while allowing for reasonable expected manufacturing impurities that should be consistently achievable by responsible chemical manufacturers, For e.g., Azo Dyes.
## MANUFACTURING RESTRICTED SUBSTANCES LIST (MRSL)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Clause 1</th>
<th>Clause 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkylphenol Ethoxylates / Alkylphenols (APEO/AP)</td>
<td>●</td>
<td>Usage ban</td>
</tr>
<tr>
<td>Azo Dyes &amp; Pigments</td>
<td></td>
<td>● Usage ban</td>
</tr>
<tr>
<td>Dye related compounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aniline</td>
<td>●</td>
<td>Usage ban</td>
</tr>
<tr>
<td>Chlorinated Aromatic Hydrocarbons</td>
<td>●</td>
<td>Usage ban</td>
</tr>
<tr>
<td>Chlorinated Bleaching Agents</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Chlorinated Organic Solvents</td>
<td>●</td>
<td>Usage ban</td>
</tr>
<tr>
<td>Chloroparaffins</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Flame retardants</td>
<td>●</td>
<td>Usage ban</td>
</tr>
<tr>
<td>Organic Solvents</td>
<td>●</td>
<td>Usage ban</td>
</tr>
<tr>
<td>Dimethylformamide (DMF)</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Organotin Compounds</td>
<td>●</td>
<td>Usage ban</td>
</tr>
<tr>
<td>Perfluorinated Compounds (PFCs)</td>
<td>●</td>
<td>Usage ban</td>
</tr>
<tr>
<td>Phthalates</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Polyvinylchloride (PVC)</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Sand Blasting</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>
Therefore, control of MRSL & RSL in the Product Life Cycle becomes most important, as it provides:

- Consumer protection from harmful substances,
- Reduction in use of Harmful Substances
- Ensures occupational health of Workers
- Encourages Green Manufacturing processes.
- Build Corporate Social Responsibility
- Creates & Maintains Supreme Image of all the stakeholders involved.
LCA – LIFE CYCLE ASSESSMENT CRITERIA for TEXTILES

Textile Criteria LCA

- Limitation of the use of substances harmful to health and environment
- Performance and durability
- Limitations of toxic residues in fibres
- Reduction of pollution (air, water) during production

LCA .. Life Cycle Assessment
THE PRACTICAL ASPECTS OF ZDHC 2020 PROGRAM COMPLIANCE IMPLEMENTATION – MRSL & RSL

BRAND / RETAILER

VENDOR

SUB CONTRACTOR

MRSL & RSL
(Chemical Restrictions)
Compliance declaration
Test reports
Maintaining of Chemicals (All)
Inventory list

DYER

PRINTER

CHEMICAL SUPPLIER
LACK OF INFO – CONFUSION, ESCALATION OF PROBLEM?

I take Aspirin for the headache caused by the Zyrtec I take for the hayfever I got from Relenza for the uneasy stomach from the Ritalin I take for the short attention span caused by the Scopederm Ts I take for the motion sickness I got from the Lomotil I take for the diarrhea caused by the Zenikal for the uncontrolled weight gain from the Paxil I take for the anxiety from Zocor I take for my high cholesterol because exercise, a good diet, and regular chiropractic care are just too much trouble.
Challenges:

Compared to last few years, Textile Industry is witnessing:

- Increasing RAW Material Cost: Cotton, Yarn, Dyes & Chemicals;
- Increased Labor cost: 15 - 25%;
- Growing shortage of qualified persons,
- Minimal - Almost NIL Awareness of technical staff about the clear picture & exact requirements of Present ECO COMPLINACE norms.
NEED OF THE HOUR IS OF COMING TOGETHER BY ALL CONCERNED PLAYERS: BRANDS, TEXTILES MANUFACTURERS, CHEMICAL SUPPLIERS, REGULATORY AUTHORITIES & ECO-LABELLING ORGANIZATIONS:

1) TO INCREASE THE AWARENESS & SERIOUSNESS BY GIVING PROPER TRAINING TO MAJORITY OF TECHNICAL STAFF,

2) TO INCREASE R&D ACTIVITIES TO FIND OUT SIMPLE, EFFECTIVE & ECONOMICAL METHODS FOR MINIMISING NATURAL RESOURCES.

3) TO DEVELOP ECO-FRIENDLY (GREEN) & SAFE CHEMICALS FOR WET PROCESSING.

4) IN SIMPLE WAY, TO FOLLOW 212 DEGREE APPROACH.
212 Degree Approach
Be A 212 Degree Person

212°
the extra degree