

Chemicals 4.0: The next evolutionary step of the chemical industry

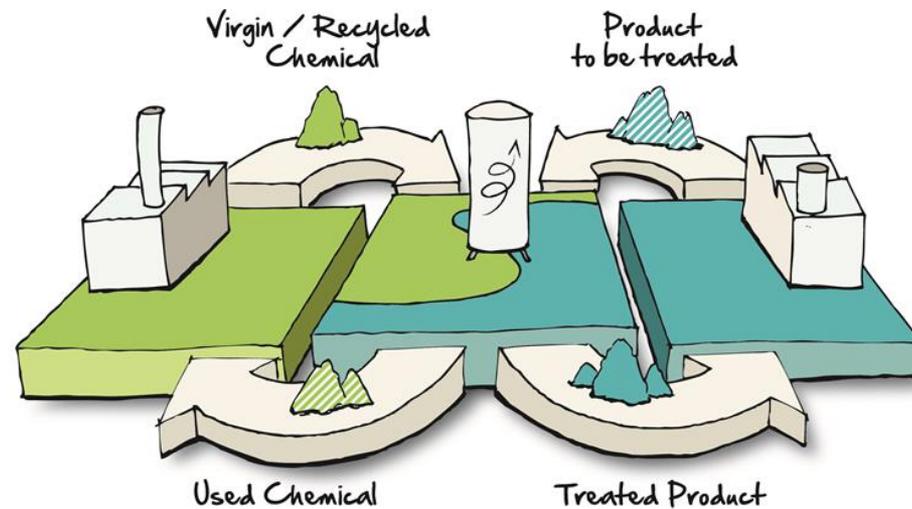
“Understanding and cooperating with customers become very important to be sustainably competitive.”

Bart Vander Velpen



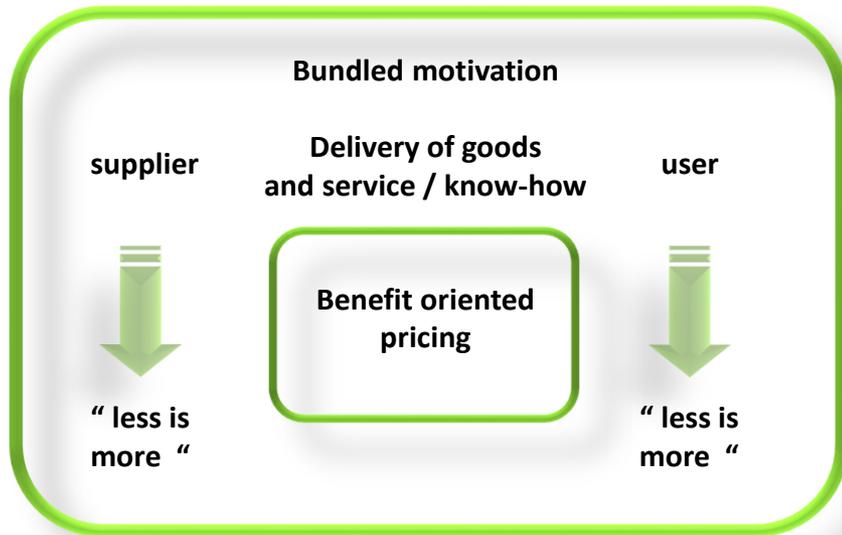
Principles of « Chemicals 4.0 »

- Framework for *re-thinking* future business and economic growth
- Focus on *availability, access and price volatility* of strategic resources, materials and energy.
- **TaBaChem** is a contributing element to a sustainable economy

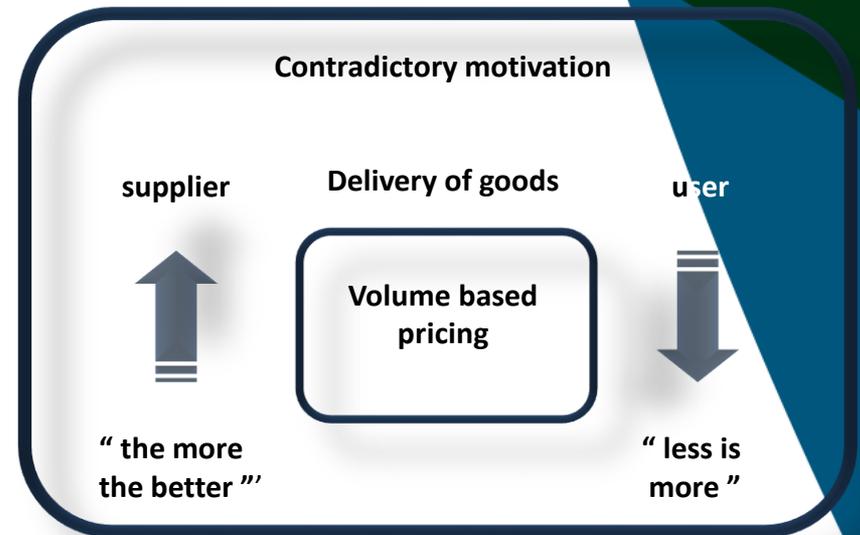


Take Back Chemicals : A general description

ChL / TaBaChem Model



Traditional Business Model



Selling of service – function of chemical is payment base – **functional unit**
Not €/kg product, but **€/result**
Volume no longer driver but cost

Close cooperation between partners
Share responsibility – know how – benefits
TaBaChem = ChL + closed loop / re-use of chemicals

Example 1



: backward business innovation – recovery of sulfuric acid

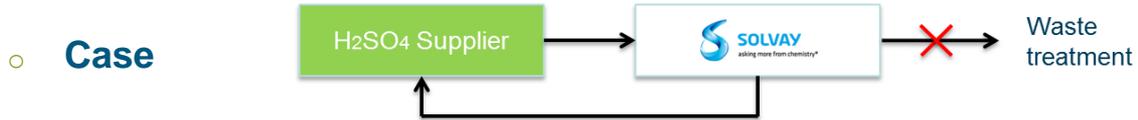


Example 1



: backward business innovation – recovery of sulfuric acid





○ **Environmental WINS**



○ **Economical**

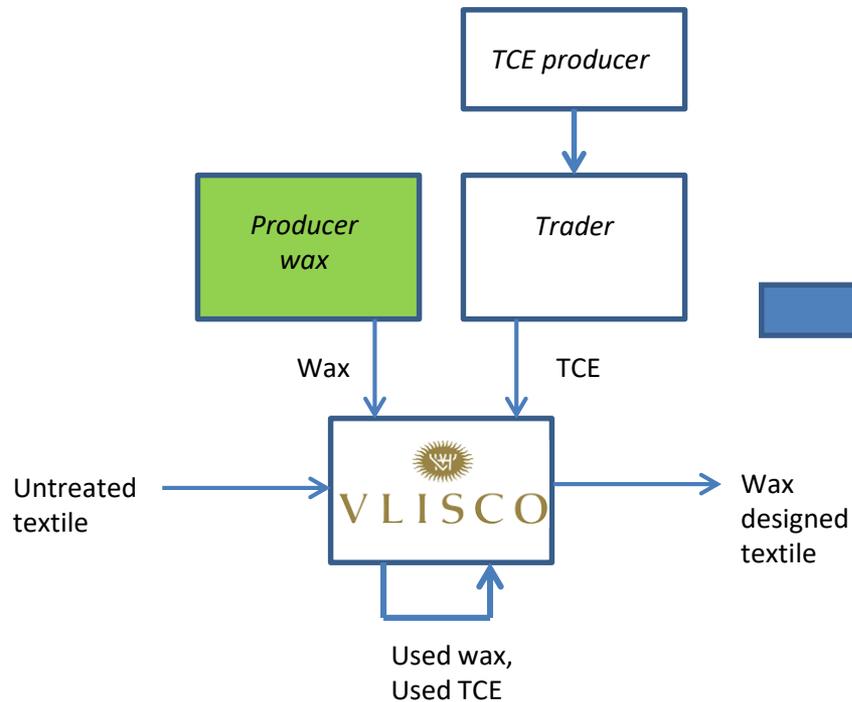
- Unit of payment: **per tonne dried chlorine**
- Feasible
- Expected Pay Back period : < 3 years
- Up-scaling opportunities for H₂SO₄ supplier

○ **Legal**

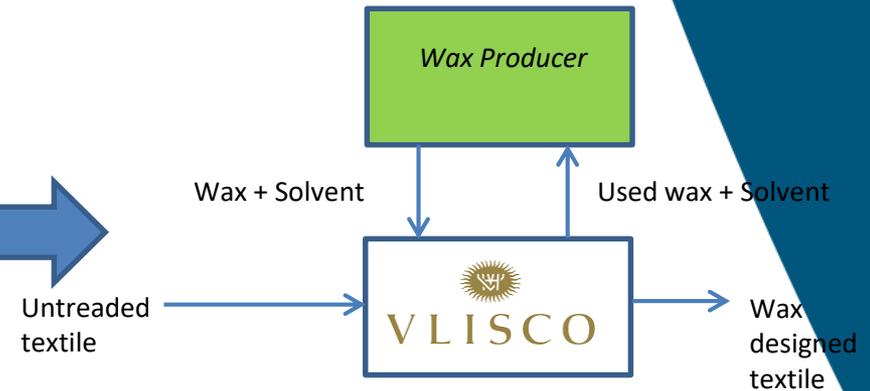
- Closed life cycle and avoidance of waste phase → no waste legislation, but product legislation
- H₂SO₄ supplier retains ownership of H₂SO₄

Example 2

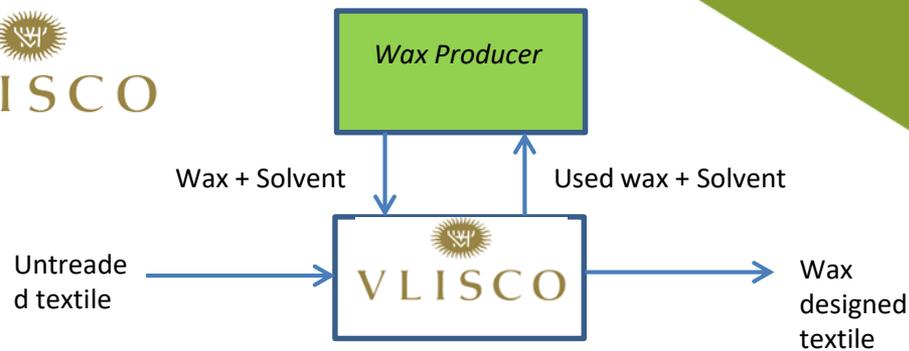
Starting Point : Use of TCE (SVHC)



New Situation: Use of substitute



Case VLISCO



→ Used wax stream recovered in cleaning unit and in batches

Environmental



Economical

- Feasibility will be further defined in the coming 5 years
- Investment > 25 million € at the textile producer & > 2 million € at the wax producer .

Legal

- Textile Producer will retain ownership of the wax → used wax has waste label
- QA-QC / Contract / Reuse / → wax obtains end-of-waste label when taken back at Textile Producer

Partnership

- Textile Producer has a service contract with wax producer for recovering waste stream.

Lessons learned



Potential Hurdles / Challenges

- ✓ **Sales + Purchasing:**
Changing perception during sales and purchasing of products
- ✓ **Technical Issues:**
Quality requirements of acquired side streams
Volume changes of acquired products
- ✓ **Legislation Issues:**
Transition from waste to material (incl. consequences for applied legislation)
Waste Policies in Europe
Careful evaluation of REACH dossier(s)
- ✓ **Logistics:**
Physical distance between Producer & User feasible from a cost & ecological point of view



Innovation Issues

- ✓ **Change of management behavior:**
All parties interested in 'long term' relation (> 5 year depending on investment requirements)
Innovative thinking by top management of parties
User and Producer/Seller willing to share knowledge and to use of mutual expertise
- ✓ **Innovation potential on process level:**
Service linked to chemicals is crucial but not core for customer
Recovering/regenerate side streams
- ✓ **New financial engineering mechanism:**
Adapting financial engineering for traded products
- ✓ **Product-Service Contract:**
Contractual agreements (from sales to sales-lease contracts), without transfer of ownership of products

- Do you have a potential demonstration case at your site?
- Are you interested in participating in a program demonstrating the feasibility of this new business model “Take Back Chemicals”?
- If interested, please contact:
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