

# Leather & Environment



Session Summary  
Dr. KJ Sreeram

## Zero Liquid Discharge



- ❧ Proud to be unique solution
- ❧ Should be considered as the last option
- ❧ Capital cost (1.5 lakh/m<sup>3</sup>) and operational cost (120-150 /m<sup>3</sup>) high
  - ❧ Subsidies needed
- ❧ Needs more assessment before adoption
  - ❧ Appears workable
  - ❧ Solutions for recovered salt needs to be identified
  - ❧ Volumes of water for evaporation needs reduction
  - ❧ Equipment life, maintenance cost, handling of shut down times
    - ❧ Needs support on power/fuel costs

## Alternate Options to ZLD



- ☞ Move from end-of-pipe to In process control
  - ☞ End-of-pipe treatment technologies are capital intensive, with varied O&M costs
    - ☞ New technologies other than evaporation and RO are needed
    - ☞ Technologies such as elevated solar pans may have high capital cost (incl. large amount of land) and low O&M
    - ☞ Needs support from in house control for TDS reduction, hydraulic load reduction to enable reduction of RO burden
  - ☞ Salt free curing → Washing (lipase) → Fibre stabilization → green fleshing → Dehairing/fibre opening (enzyme based) → Closed pickle - tan loop
  - ☞ Segregated treatment / processing of streams in post tanning
- ☞ Adopt basket of technologies developed under ZERIL
  - ☞ Currently under implementation in Kanpur, Sri Lanka

## Salt free, Zero Emission Chrome Tanning



- ☞ Eye opener technology
- ☞ Pickle lets out 80,000-100,000 ppm of chlorides
- ☞ A CSIR-CLRI technology for chrome tanning without pickle is today available
  - ☞ High pH tanning through masked chromium, with recycle option
  - ☞ Regulated hydrolysis of Cr
  - ☞ NO new chemicals - cost saving Rs 200,000/100 ton
- ☞ Simple, easy to control, eradicates use of salt, sulfuric acid, reduces chromium use - BRAND IMAGE

## Wealth from Solid Wastes



- ❧ Keratin hydrolysate for cosmetics
- ❧ Animal fleshing can be used to make proteases and lipases with wide applications or for biogas recovery, biodiesel, bioethanol or biohydrogen or bio-organic manure, fish meal
- ❧ Tanned leathers for fuel
- ❧ Edible salt from RO waste

## Incentivizing clean tech



- ❧ Clean technology implementation fund needed
  - ❧ Grants and loans for process intensification
  - ❧ Modernization program to be expanded to clean technologies and process control, byproduct recovery, odor control etc
  - ❧ Start ups to be supported for clean technology
  - ❧ Capital subsidies and tax holidays for ZLD
- ❧ Special DST, DSIR, DBT programs for technology development, scaleup and demonstration
- ❧ Three part tariff on treated water
  - ❧ Volume based cost
  - ❧ User related charges to meet O&M and RO costs
  - ❧ Tradable permit system for CETPs

## Technology Need, Development and Implementation Measures



- ☞ Industry needs more respect, more recognition and more revenue. For which, it has to
  - ☞ Be amenable to change
  - ☞ Look for innovations
  - ☞ Provide platforms for change
- ☞ Institute needs to provide technology preparedness with long lead time for testing and validation
- ☞ Amongst end-of-pipe treatment systems, industry wishes for technologies with high capital costs but low O&M
- ☞ Process modifications seem essential to meet stipulations
  - ☞ High, medium and low priority areas for change have been identified
  - ☞ Process intensification, new leather science, modified equipment, new raw materials, better byproduct recovery
  - ☞ Tightening front end for an easy final step
  - ☞ Chemical companies are committed to provide sustainable technologies
  - ☞ REACH norms need to be met

## Technology Dissemination



- ☞ Technology dissemination to spread to all parts of country to meet the exigency in waiting
- ☞ Clean technology mission (macro and micro) needs to be launched
- ☞ CETPs to serve as tools for clean technology promotion