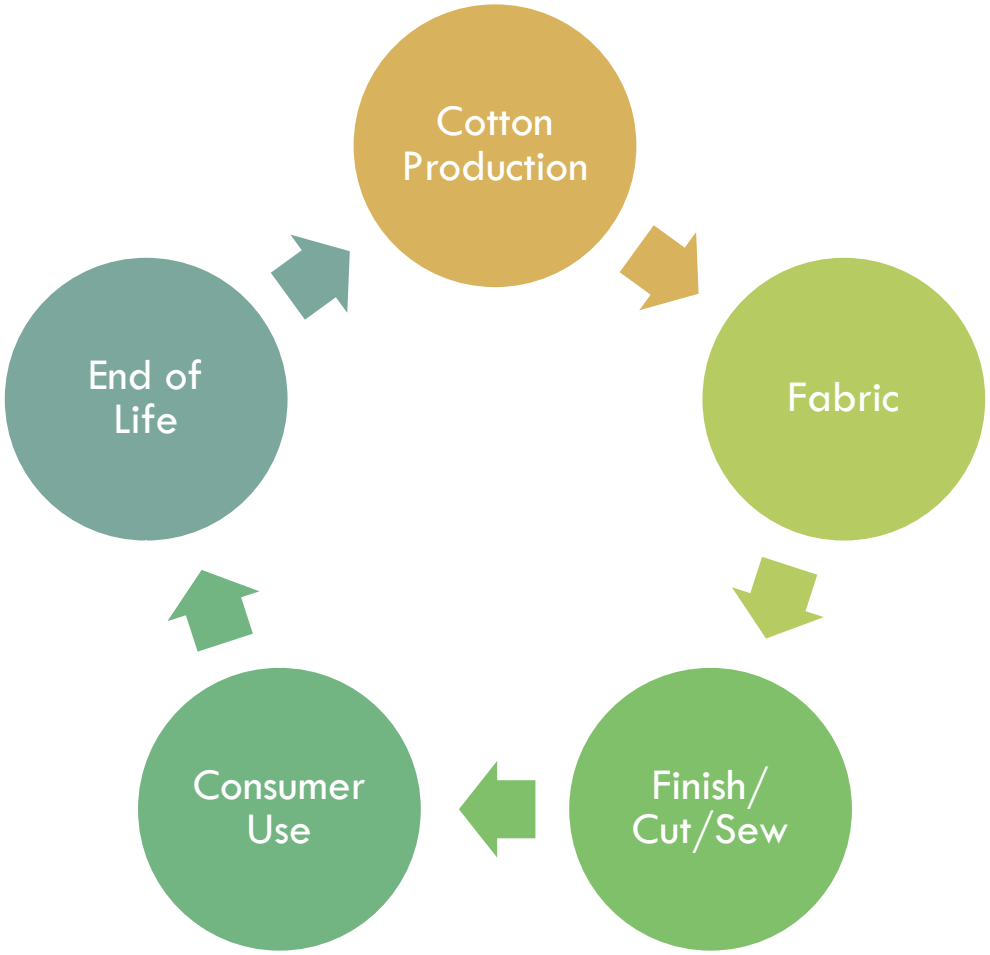
Life Cycle Analysis

Quantifying Cotton's Foot Print

Overview

- What is “LCA” and “LCI”
- Overview of the current effort to develop a robust LCI for cotton
- Example results from Levi’s LCA for 501 Jeans
- → Pat O’Leary to provide details on the agricultural data collection.

“Life Cycle” Perspective on Cotton



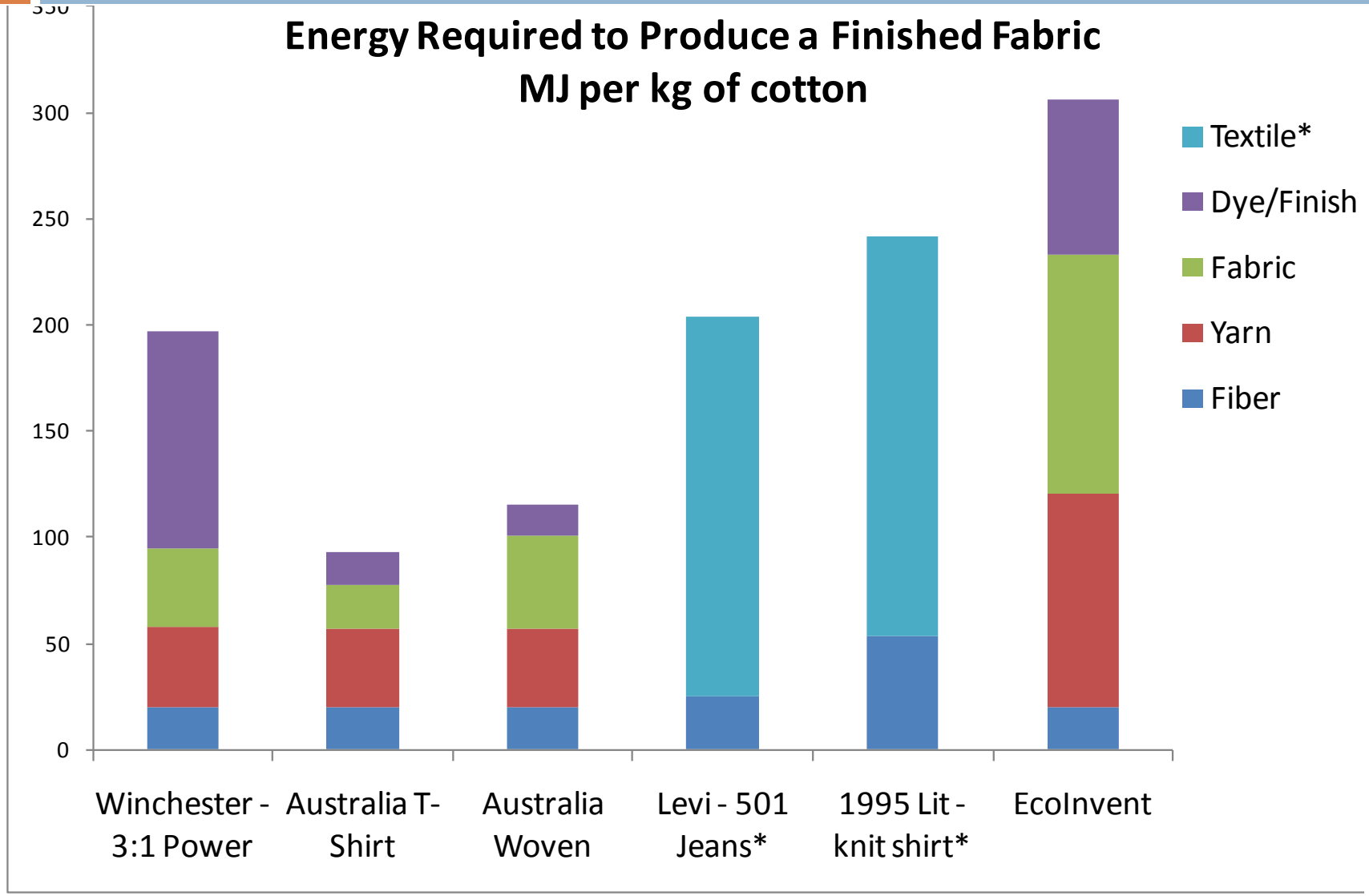
ISO 14044 – LCA Process

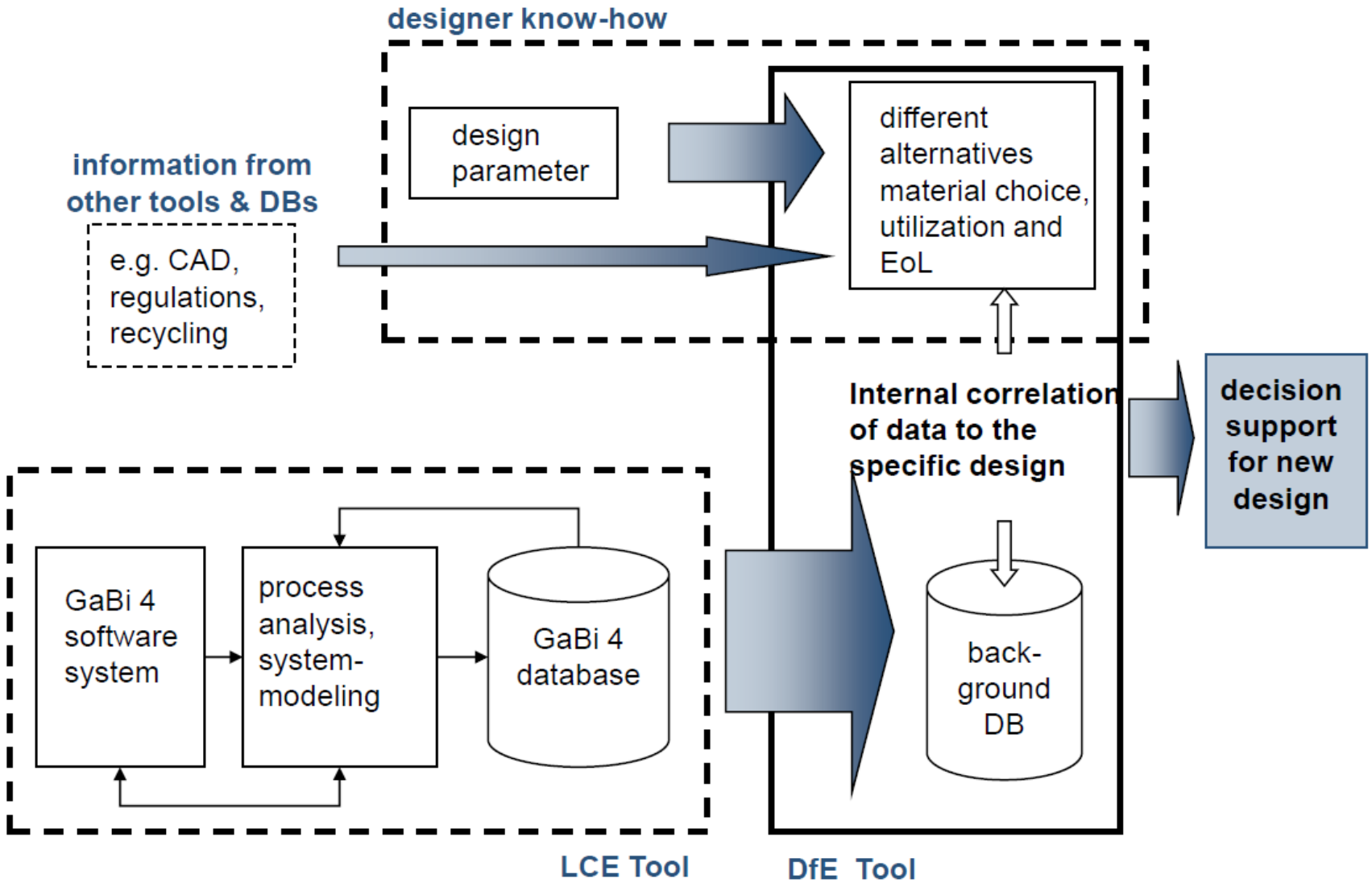
- Goal and Scope Definition of the Project
- **Life Cycle Inventory Development**
  - Data collection
  - Literature review
- Impact Assessment
- Interpretation
- Critical Review

Vision 21 LCI

- Collaborative effort:
  - Cotton Foundation
  - Cotton Incorporated
  - Cotton Council International
  - PE Americas
  - Carbon Trust
- **Goal**: Compile a robust and comprehensive life cycle inventory for cotton.

Why does it matter?




designer know-how
design parameter
different alternatives material choice, utilization and EoL
information from other tools & DBs
e.g. CAD, regulations, recycling
Internal correlation of data to the specific design
decision support for new design
GaBi 4 software system
process analysis, system-modeling
GaBi 4 database
back-ground DB
LCE Tool
DfE Tool

Vision 21 Data Collection Overview

- Agricultural Production by region
  - China
  - India
  - US
- Textile Production (knit and woven)
  - China
  - India
  - Turkey
  - Latin America

Cotton Incorporated's Lifestyle Monitor™ Survey:

How Consumers WASH Apparel & Home Textile Products

Pajamas

47% wash in washer with warm water

- 44% wash in washer with cold water
- 10% wash in washer with hot water
- 0% usually dry clean

A pair of denim jeans

60% wash in washer with cold water

- 34% wash in washer with warm water
- 5% wash in washer with hot water
- 0% usually dry clean

Dress

53% wash in washer with cold water

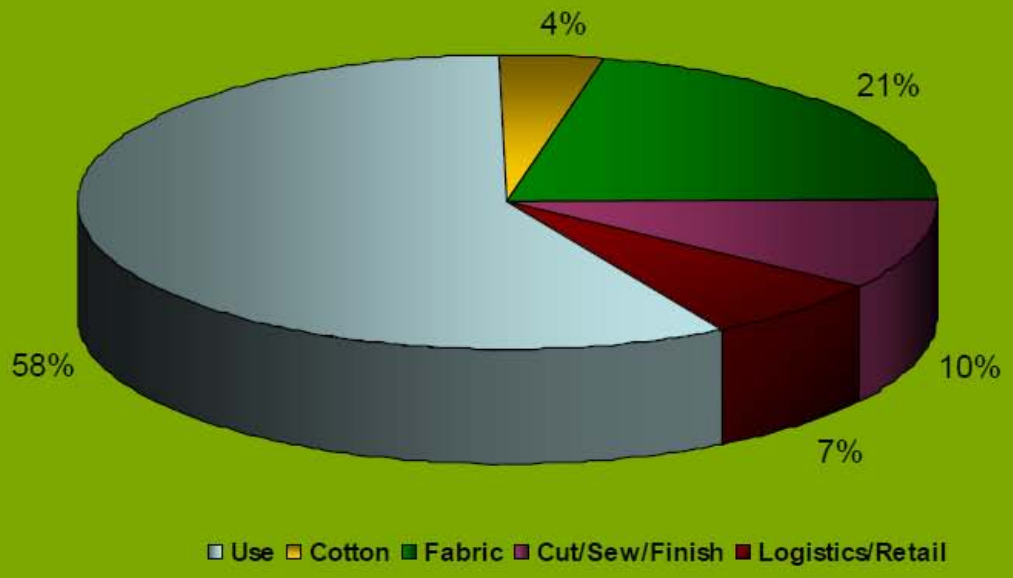
- 26% usually dry clean
- 19% wash in washer with warm water
- 1% wash in washer with hot water

Levi's® LCA Study

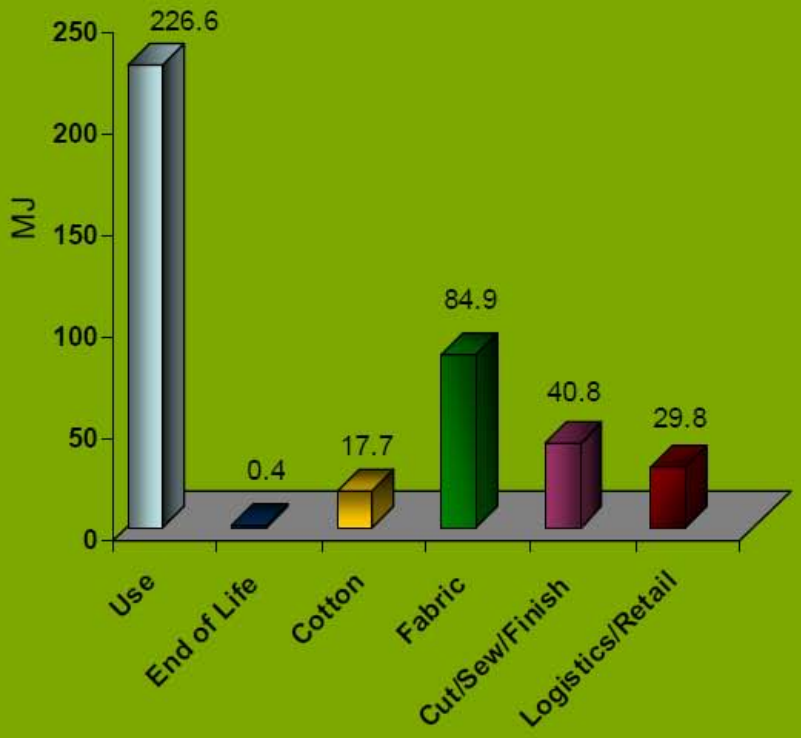
- See:
  - http://www.levistrauss.com/Downloads/LCASummary.pdf
  - Or Google "Levi's LCA jeans"
- Study based on:
  - Levi's® 501® Jean; 0193 Finish; Medium Stone Wash
  - 2006 Production year
  - Cotton – West Texas; MS; Brazil -> Fabric (Mexico) -> cut & sew (Dominican Republic) -> US Consumer -> Landfill [Habitat house in New Orleans]

Levi's® 501® Jeans – Energy Use

Cradle-to-Grave Energy Use, % by Phase



Cradle-to-Grave Energy Use (MJ), Amount by Phase



For the studied Levi's® 501® jeans (cradle to grave), the energy-use impact was highest at the consumer-use phase (58%)

Total = 400 MJ = 111 kWh = 379,127 BTU = 2.7 gal diesel

→ Powering a computer for 70 days (8-hr per day)