



Scaling LCA with IPC-175x

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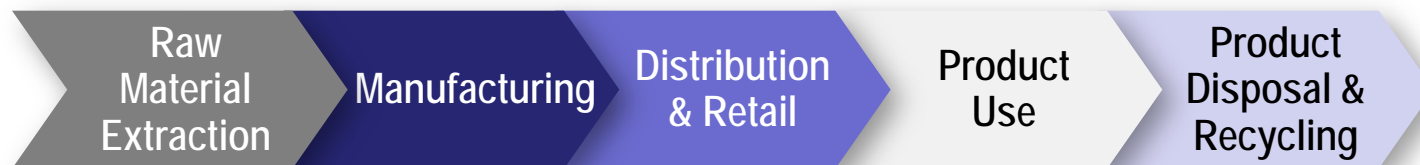
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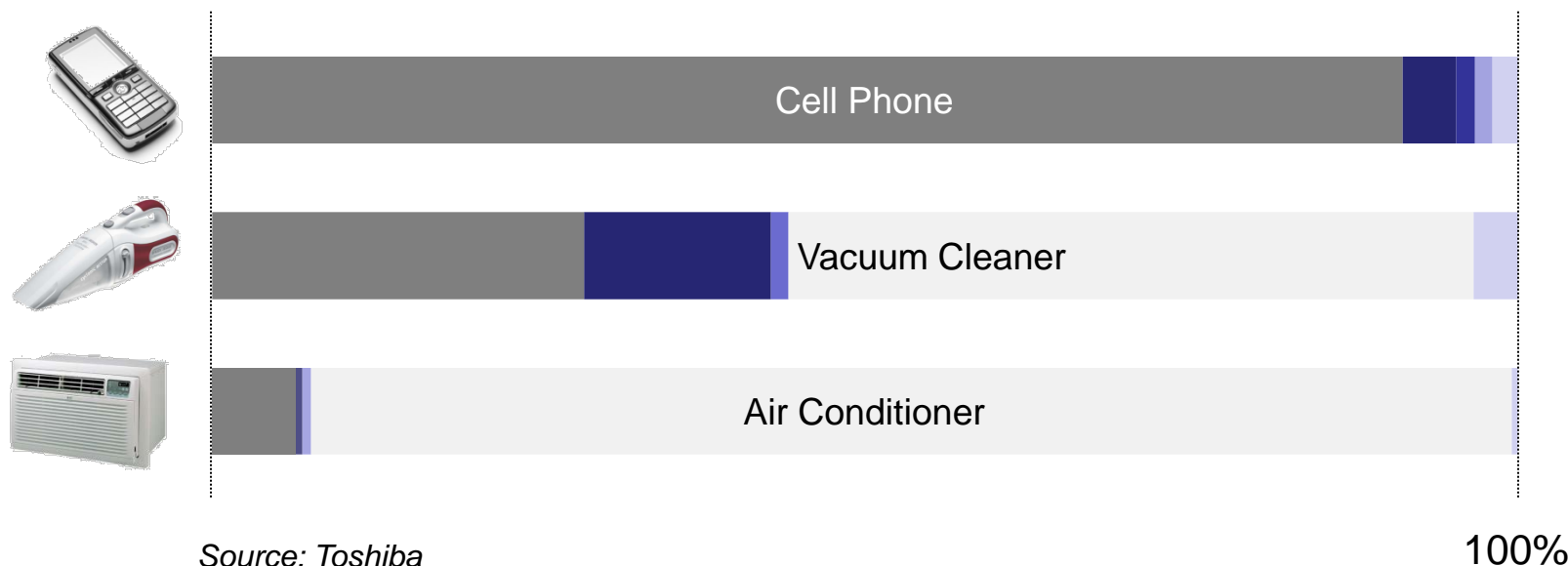


Live Cycle Assessment

All products impact the environment throughout their lifecycle through the consumption of resources and generation of waste

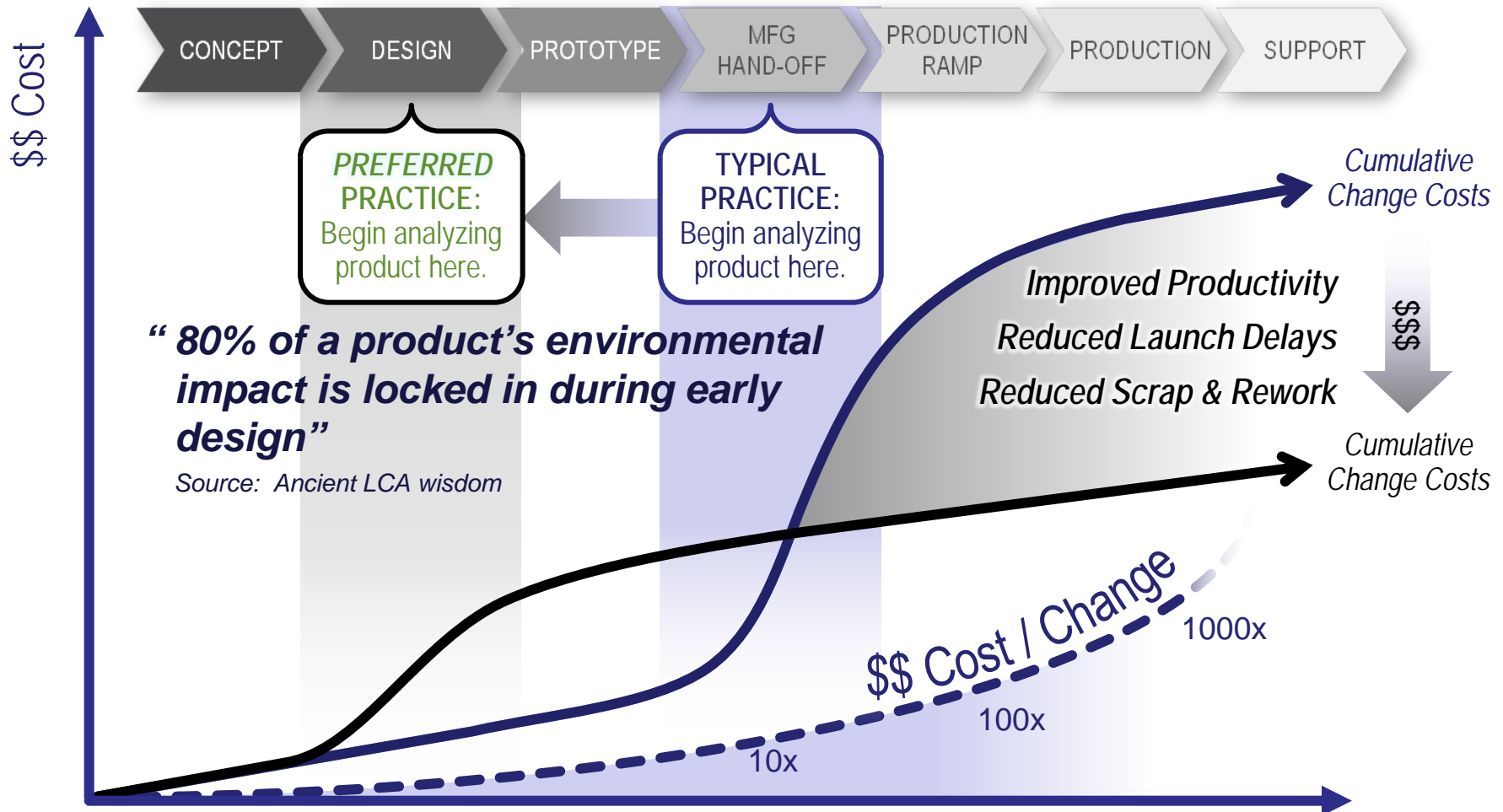


Relative impacts vary by product type and lifecycle stage...





Early Product Analysis / “DFX” Challenge





Keys to Scaling #1: Processes and Systems

Typical Enterprise Scenario

- 1 – 2 LCA Specialists somewhere serving global organization
- Performing LCA on a few products after development finished
- Maxed out, crunching numbers, chasing data all day
- Communications with engineers are about getting their data



Typical Objective

- Run LCA's on all products
- Understand product's environmental impact while in development
- Use LCA to develop greener products

How to get there

- Hire an LCA department of 20 – 50 staff
- Embed LCA in engineering process, using the right tools
- Transform specialists into mentors of product engineering teams



Systems can Extend “Traditional” LCA

Extending, not replacing traditional tools and experts...

Enterprise System

For cross-functional teams

(Purchasing, Sustainability, Supply Chain, Engineering,
Designers)

Streamlined LCA's on
BOM's in System

Using Supplier Data

Using available Life
Cycle Impact data

Automated

Support

Traditional LCA

For LCA specialists

In-depth Modeling
New Data

Data

Public Data
Commercial Data



Keys to Scaling #2: Data Exchange Standards

The Internet is Based on Standards

Standards Enable Communication

Standards Enable Repetition

Try Being Your Supplier Answering Yet Another Custom Spreadsheet



Standards May Work Across Industries



Leveraging Environmental Compliance Practices

A single product may need to comply with multiple environmental standards.

Compliance Standard

- Substances
- Thresholds
- Exemptions

Environmental Impact

- Materials
- Transport

Functionally comparable parts may be made up of very different materials and be coming from different suppliers



Company Part

Supplier Part

Supplier Part

Supplier Part

Company Part

Supplier Part

Supplier Part

Company Part

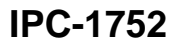
Supplier Part

Supplier Part

Materials
Substances
Masses

A product consists of multiple company parts (3 shown) each sourced from one or more suppliers.

Each supplier part may have a different makeup, which will impact product performance

[illegible]



IPC-175x Data Exchange Standards

175x Intent: To establish a standard data exchange format that will facilitate, improve, and secure data transfer between all members of a supply chain.

Written by Industry Members (volunteers)

Primarily Driven by RoHS and REACH

Subject-specific sectionals written by sub-committees

- IPC-1751: General Requirements and 175x XML schema
- IPC-1752A: Product Materials Declaration
- IPC-1756: (Electronics) Process and Manufacturing Data
- IPC-1758: Shipping and Packaging Materials Declaration (in final review)
- IPC-175_: Batteries and Battery Materials Declaration (under development)

New sectionals as needed, driven by members



175x Example (snippet) – Machine Readable

<SubProduct numberOfInstances="6">

<ProductID requesterItemName="Rotor Fin" requesterItemNumber="RT2100"

manufacturingSite="Lisbon" effectiveDate="2010-05-02-00:36" version="1.0" itemName="Rotor Fin"
itemNumber="RT2100">

<Amount value="0.15" UOM="kg"/>

</ProductID>

<MaterialInfo>

<HomogeneousMaterialList>

<HomogeneousMaterial name="Steel" materialGroupName="Stainless steel">

<Amount UOM="kg" value="0.15"/>

<SubstanceCategoryList>

<SubstanceCategoryListID authority="EIA" identity="R"/>

<SubstanceCategory name="Nickel">

<Substance name="Nickel">

<SubstanceID authority="CAS" identity="7440-02-0"/>

<Amount UOM="kg" value="0.0050"/>

</Substance>

</SubstanceCategory>

</SubstanceCategoryList>

<SubstanceCategoryList>

<SubstanceCategoryListID authority="EIA" identity="I"/>

<SubstanceCategory name="Beryllium oxide">

<Substance name="Beryllium oxide">

<SubstanceID authority="CAS" identity="1304-56-9"/>

<Amount UOM="kg" value="0.0050"/>

.....

Sub-Product

Material in Sub-Product

Substance in Material in Sub-Product

Substance in Material in Sub-Product



Current 175x Limitations (Relative to LCA needs)

1752A is Still Maturing

Few Tools for Suppliers

- Committee abandoned pdf

Not easy to understand

- Supplier training is critical for success

No Rules / List for Material Names

- Lots of “Miscellaneum” in products

No Manufacturing Process Information

- Except for electronics / soldering

Only 1st Tier Supplier Information

- No Material Sourcing Data



175x Opportunities for LCA

Call to Action

Form a Sub-Committee to Create an LCA Sectional

- Manufacturing Process Declaration
- Standardized Material Names / Hierarchies
- (Raw) Material Sourcing
-

Leverage Other Standardization Efforts

- No Need to Re-Invent the Wheel
- Remember 175x's Purpose is To Be a Data Exchange Format





Interested in enhancing the 175x standard?
Contact me at [jorgen \(at\) jorgenvos.com](mailto:jorgen@jorgenvos.com)

Thank You