MITIGATING CARBON FOOTPRINT CONSIDERING FORESTRY IN PRODUCT MIX

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HART’S SUSTAINABLE VALUE CREATION MATRIX

Life Cycle Design (LCD) is a systems-oriented approach for designing more ecologically and economically sustainable product systems.

LCD integrates environmental requirements into each design stage so total impacts caused by the product system can be reduced.

Incorporating key environmental requirements into the design process as early as possible can prevent the need for costly, time-consuming adjustments later.
Our Products: Life Cycle Analysis

For this part of the footprint, we looked at each product's "life" from beginning to end and left nothing out. Our materials are by and large much more sustainable than fossil fuel alternatives, but the bulk of our impact still comes from them. That is why finding the best, most sustainable materials to make our products from will always be a top priority for us.
DESIGN FOR ENVIRONMENT (DFE): INTERVENTIONS

- Modular Approach to design
- Use of universal components
- Use of recycled **material**
- Newer assembly method
- Promoting recyclability
- Choice of Clean Technologies
- Use of renewable **material**
DESIGN FOR LONGEVITY

• Timeless, classical design
• Long lifespan
• Durability
• Designed for ease of repair and maintenance
• Designed for modularity
• Possibilities for reuse
• Possibility to upgrade with latest technology
DESIGN FOR DISPOSAL

• Fashionable design (reuse)
• Designed for takeback (rework/remanufacturing)
• Designed for recycling
• Designed for eco-friendly disposal
Life Cycle or Eco Design strategies (LiDS) Wheel

(Source: Brezet et al., 1994; Hemel & Keldmana, 1996)
WHETHER FORESTS & FOREST PRODUCTS CAN MEET THESE REQUIREMENTS ???
WE MANAGE FORESTS FOR...

- Industrial wood production,
- Fuelwood production,
- Production of non-timber forest products (NTFP),
- Protection of natural resources (e.g. water and soil),
- Wildlife management, and
- Recreation.

Source: Brown 1996
WHY FORESTRY IN PRODUCT MIX ???

Considering Forestry into product mix

- Embodied energy for production
- Carbon sequestration through forestry
- Biodegradability of products
- Carbon emission in product's life
- Renewable & recyclable material
EMBODIED ENERGY FOR PRODUCTION

Compared to the energy required to produce a ton of wood, it takes:

- 5 times more energy to produce 1 ton of cement
- 14 times more energy to produce 1 ton of glass.
- 24 times more energy to produce 1 ton of steel.
- 126 times more energy to produce 1 ton of aluminium.

Source: Athena Institute. Life-cycle analysis: The environmental proof of wood
Typical sequestration rates for afforestation/reforestation, in tonnes of carbon per hectare per year, are: 0.8 to 2.4 tonnes in boreal forests, 0.7 to 7.5 tonnes in temperate regions and 3.2 to 10 tonnes in the tropics (Brown et al., 1996)

In a fully integrated supply chain, business enterprises can use forest carbon credits to offset emissions in the downstream operations (manufacturing/processing, packaging, distribution etc.)
BIODEGRADABILITY OF PRODUCT OR COMPONENT

Positive as well as negative consequences...

(Source: Life Cycle Assessment of Forest Products: Challenges and Solutions, By Gustav Sandin, Greg M. Peters, Magdalena Svanström)
GENERIC SUPPLY CHAIN AND RELATED ENVIRONMENTAL AND SOCIAL IMPACTS

ENVIRONMENTAL AND SOCIAL IMPACTS THROUGHOUT THE SUPPLY SYSTEM

PRIMARY SECTOR
- SFM: Unique forest values, conversion
- Climate effects
- Harvesting in traditional and community lands without proper permission
- Logging in sites important for traditional & local populations
- Worker's health & safety
- Fair wages

SECONDARY SECTOR
- Efficiency
- Pollution
- Climate effects
- Source reduction
- Worker's health & safety
- Fair wages

TERTIARY SECTOR
- Efficiency
- Pollution
- Climate effects
- Recycling
- Worker's health & safety
- Fair wages

Use
- Recycling
- Climate effects
- Efficiency
- Source reduction

Disposal
- Efficiency
- Pollution
- Climate effects
- Recycling
- Worker's health & safety
- Fair wages

Data representing excessive trade do not quantify amounts of wood used in manufacturing and transportation.
Comparison of packaging materials emissions according to different lifecycle paths
CAN WE MEET THE SCALE ???

- With increase in share of forestry in product mix:
  Burdon on nature & Burdon on customers ???
  Whether forestry products will remain luxury ???
RESEARCH GAP

Product life / Quality /..

Product Carbon Footprint & cost

Mapping of different material

Mapping of different material
THANK YOU !!!