

Metal LCI Databases and Methodological Issues

**Presented to:
International Workshop on Life Cycle
Assessment and Metals**

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**Montreal
April 15, 2002**

Presentation Outline

- ◆ Athena Institute's interest and approach
- ◆ Perspective on environmental realities
- ◆ Cautions and critical distinctions
- ◆ Overview of the US LCI Database Project
- ◆ Key LCI issues

ATHENA™ Institute Interest/Approach

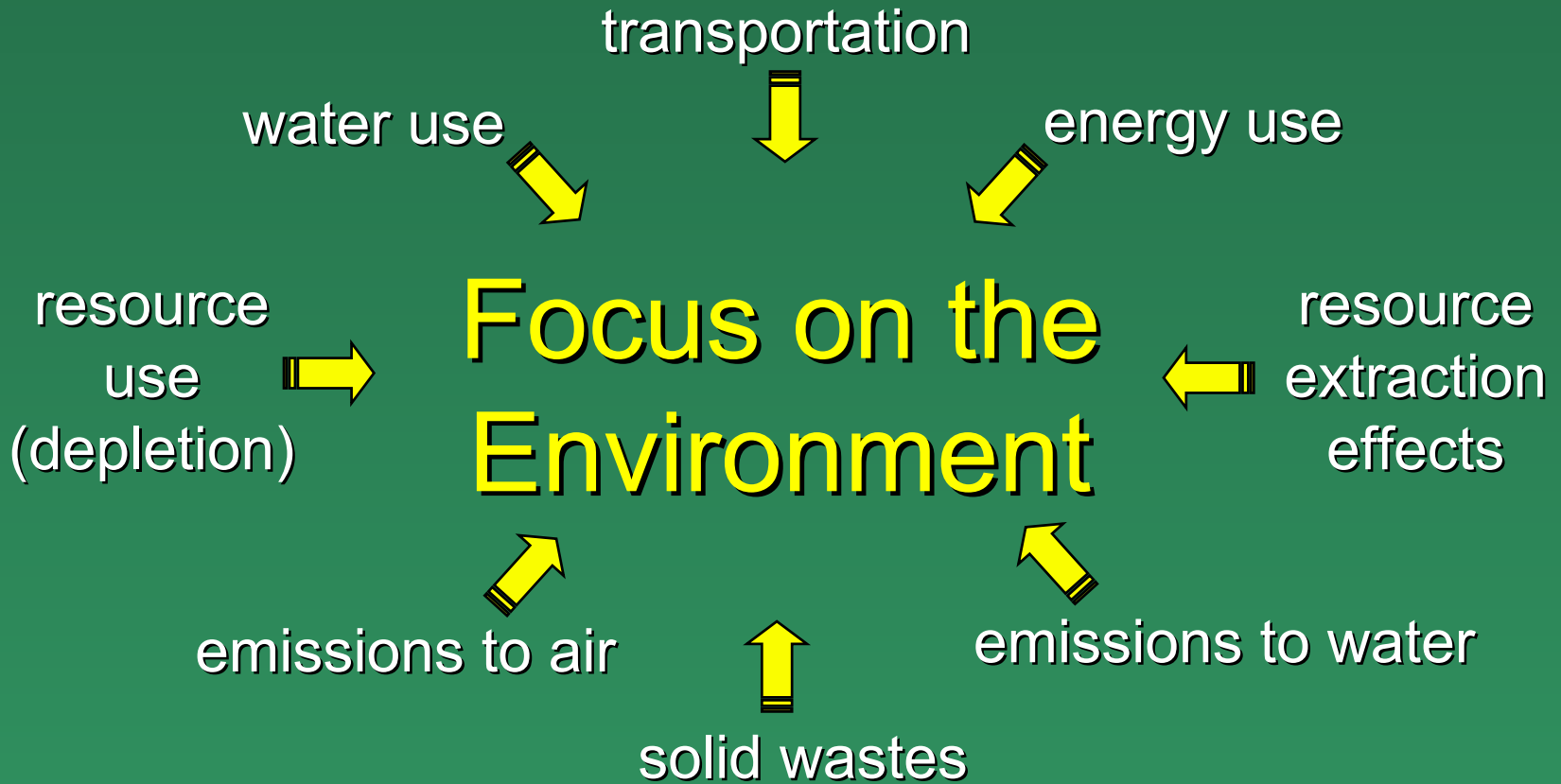
A not-for-profit organization dedicated to furthering sustainability of the built environment.

Our LCI/LCA interest:

- » developing LCI data for use in ATHENA, a whole building assessment tool for use by architects & engineers

Basic approach:

- » retain industry experts and provide them with essential LCA knowledge



The triple bottom line is here to stay!

Environmental realities

- ◆ Environmental events and decisions are increasingly transnational
- ◆ Environment is geopolitics, not just a subject for activists and scientists
- ◆ Clutter and confusion with a proliferation of eco-methods, eco-labels, eco-orgs, eco-events
- ◆ A hunger for information and data
- ◆ Misinformation and speculation often push aside science
- ◆ Wrong answers may carry as much weight with the uninformed as correct ones
- ◆ LCA practitioners and industry have to work together to make available the best information possible

The LCI is Critical

Quality of LCA results \leq Quality of LCI data

No matter what tool is used or
how results are presented

Bear in mind that . . .

- ◆ LCA is a physical accounting system with politicized protocols and conventions
- ◆ While it's a useful tool for businesses from both internal and external perspectives
- ◆ It is being used and sometimes misused in a highly competitive atmosphere
 - » product-to-product
 - » database-to-database
 - » tool-to-tool

Critical Distinctions

- ◆ Different practitioner tasks
 - » meeting the specific needs of one client
 - » meeting a broader demand for data
- ◆ Consequential vs. attributional LCA
- ◆ Generic vs. supplier specific LCI/LCA

The US LCI Database Project

A public/private research partnership

The Project Objective

To develop a publicly available LCI database for commonly used materials, products, and processes

Users and Uses

- ◆ Support decision-support systems and tools
 - » E.g., ATHENA, BEES, LEED
- ◆ Support supplier-specific LCA work
- ◆ Provide regional benchmarks for assessing company, plant or new technology data
- ◆ Provide the foundation for subsequent life cycle assessment tasks

Which means generic, attributional LCI data

Key Database Criteria

- ◆ Consistent protocol meeting ISO guidelines and standards
 - » transparent
 - » representative
 - » peer reviewed
- ◆ Uniform treatment of all materials
- ◆ Regional data development as necessary
- ◆ Fully accessible data modules in format(s) to maximize use

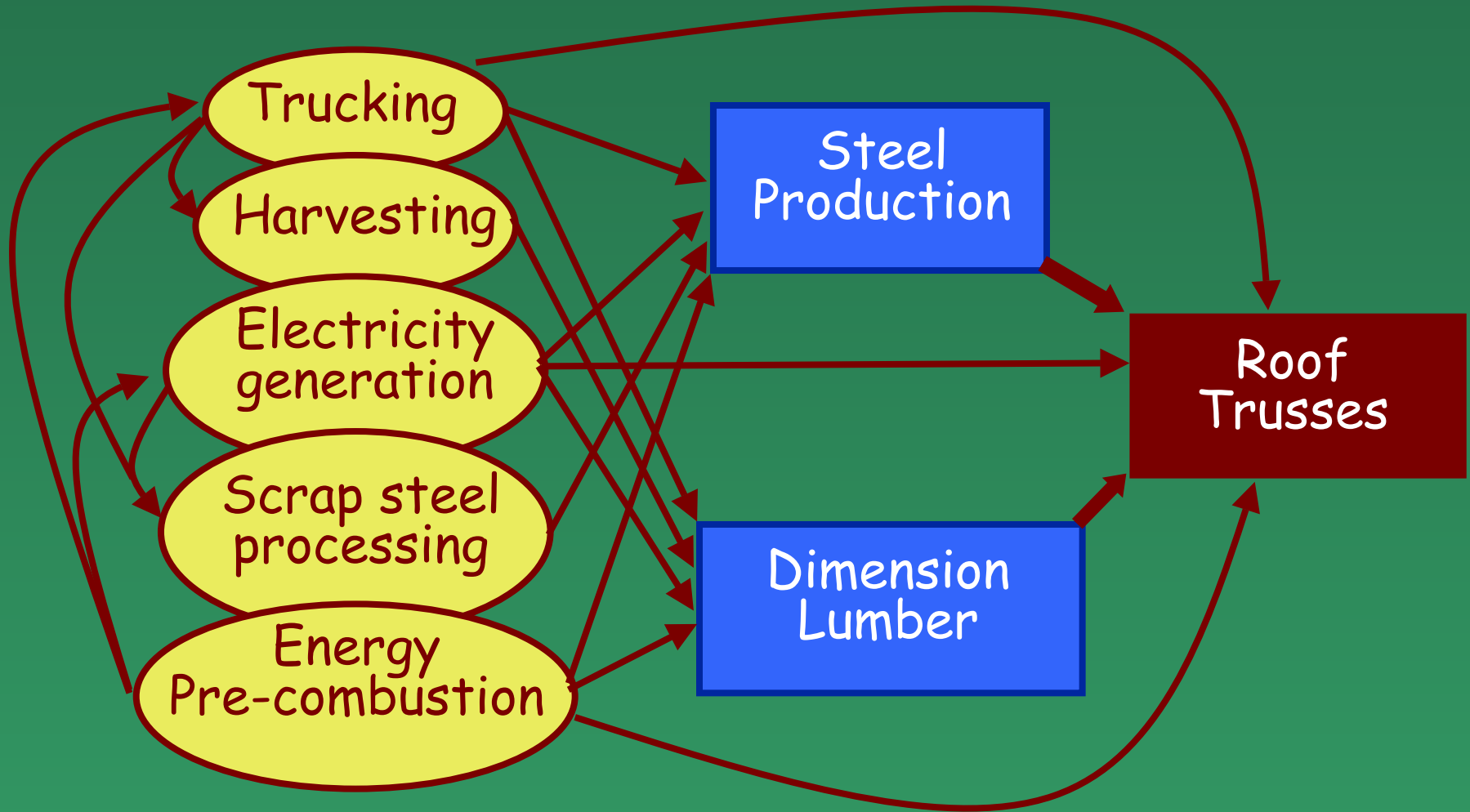
Scope

- ◆ Common processes
 - » electricity generation, transportation,
 - » energy pre-combustion
 - » end-of-life modules
- ◆ Commodity level manufacturing for commonly used materials and products
 - » unit process data
 - » cradle-to-gate and gate-to-gate
- ◆ Standard transformation processes
 - » stamping, pressing, painting and other “heat, beat and treat” operations

Status

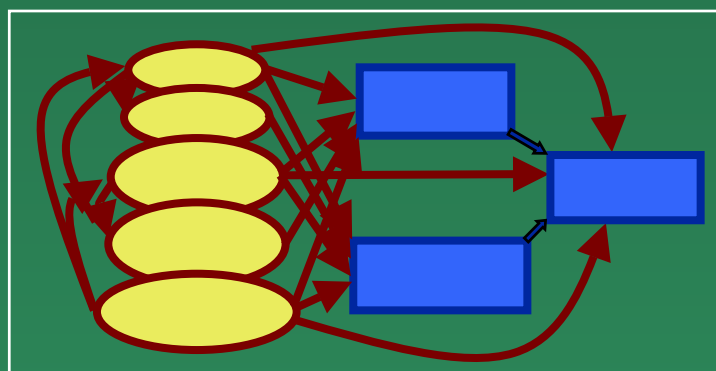
- ◆ Phase I complete with funding from DOE, GSA and the Navy through NREL
 - » broadly representative advisory group
 - » base protocol developed
 - » Phase II work program recommendations
- ◆ Phase II:
 - » critical common process data (e.g., energy, transportation) and other basic modules
 - » 2 years; \$1.2 to \$1.8 million
- ◆ Phase III:
 - » maintenance and expansion by NREL (ongoing)

Working with process modules



Using the results

LCI of concrete



LCA
tools

Impact Potentials
Global warming
Ozone depletion
Etc.

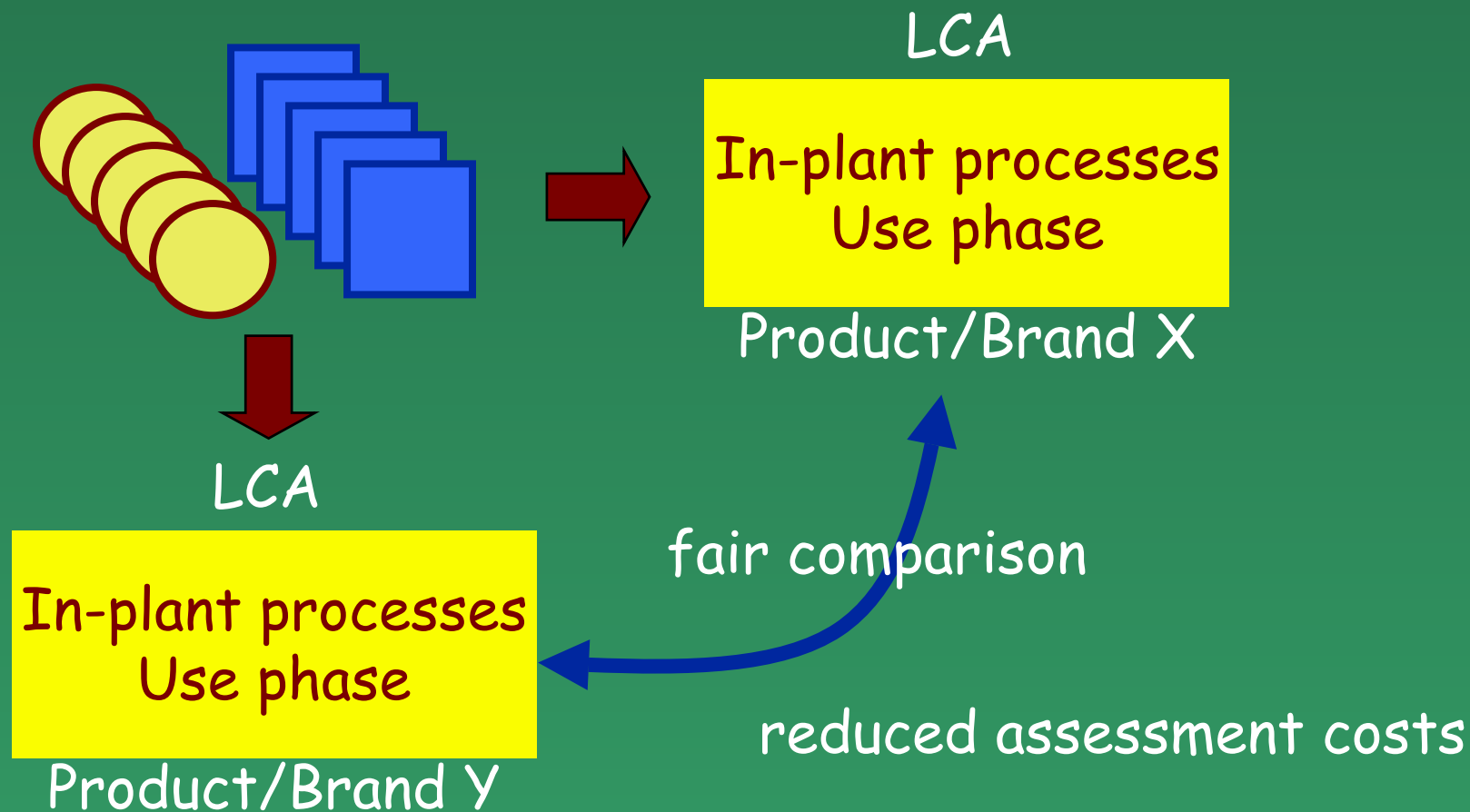
specialized
tools

ATHENA™

BEEES

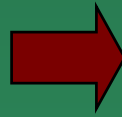
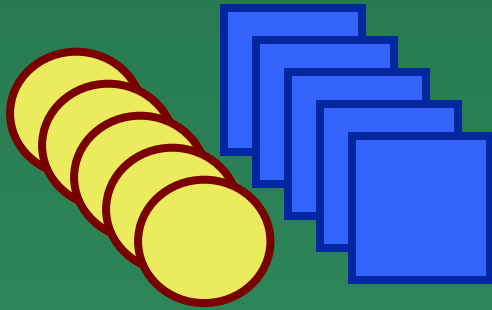
Supplier-specific uses

Database modules



Benchmarking & Validation

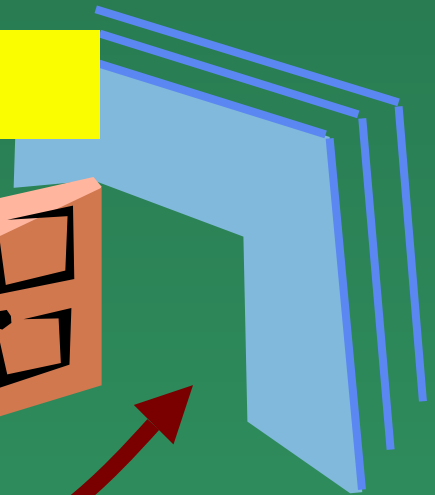
Database modules



Generic LCA



Product X



Supplier LCAs



Product X

benchmarking

validation



Issues

- ◆ Understanding and communication
 - » between industry and LCA practitioners
 - » among practitioners
- ◆ Allocation — physical causality vs economics
 - » availability of upstream price data
- ◆ Recycled content vs recyclability vs recycling potential
 - » is LCA science or ideology?
 - » when is the loop open or closed
 - » when is there a change in inherent properties
- ◆ Relative treatment of home, prompt, and obsolete scrap
- ◆ Handling imports (material inputs, components, products)
- ◆ Transparency
 - » how much is enough?
 - » ability to disaggregate and use common process modules

Workshop Challenge

Establish an improved basis for communication

Maintain a balance between the ideal and the practical