

Recycling/
Reuse/
Disposal



Resource
Extraction



Demolition



Manufacturing



Athena
Institute



On-site
Construction

Occupancy/
Maintenance





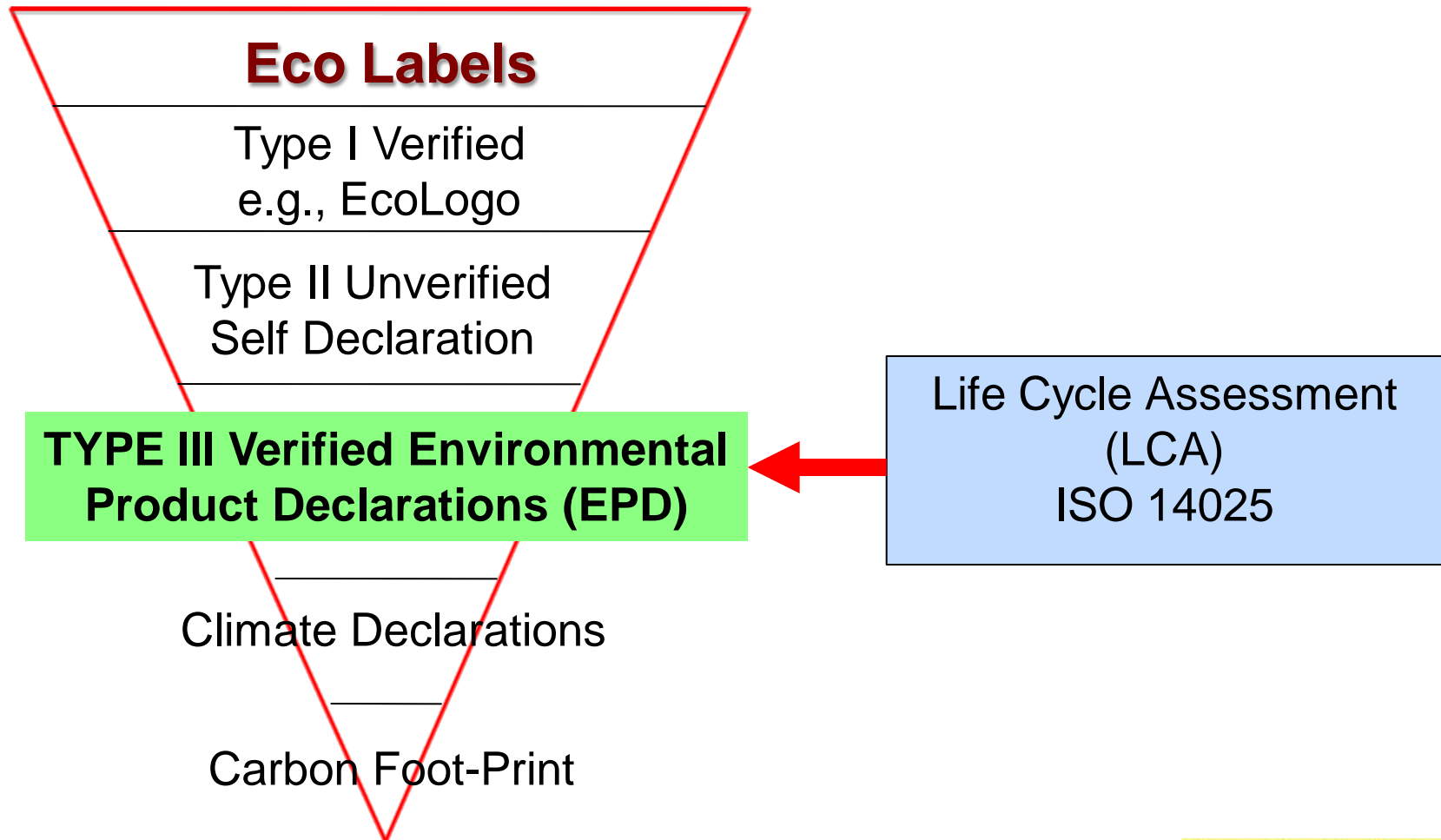
Labels, Codes, Standards & Rating Systems: The Role of LCA

Wayne Trusty

May 13, 2010

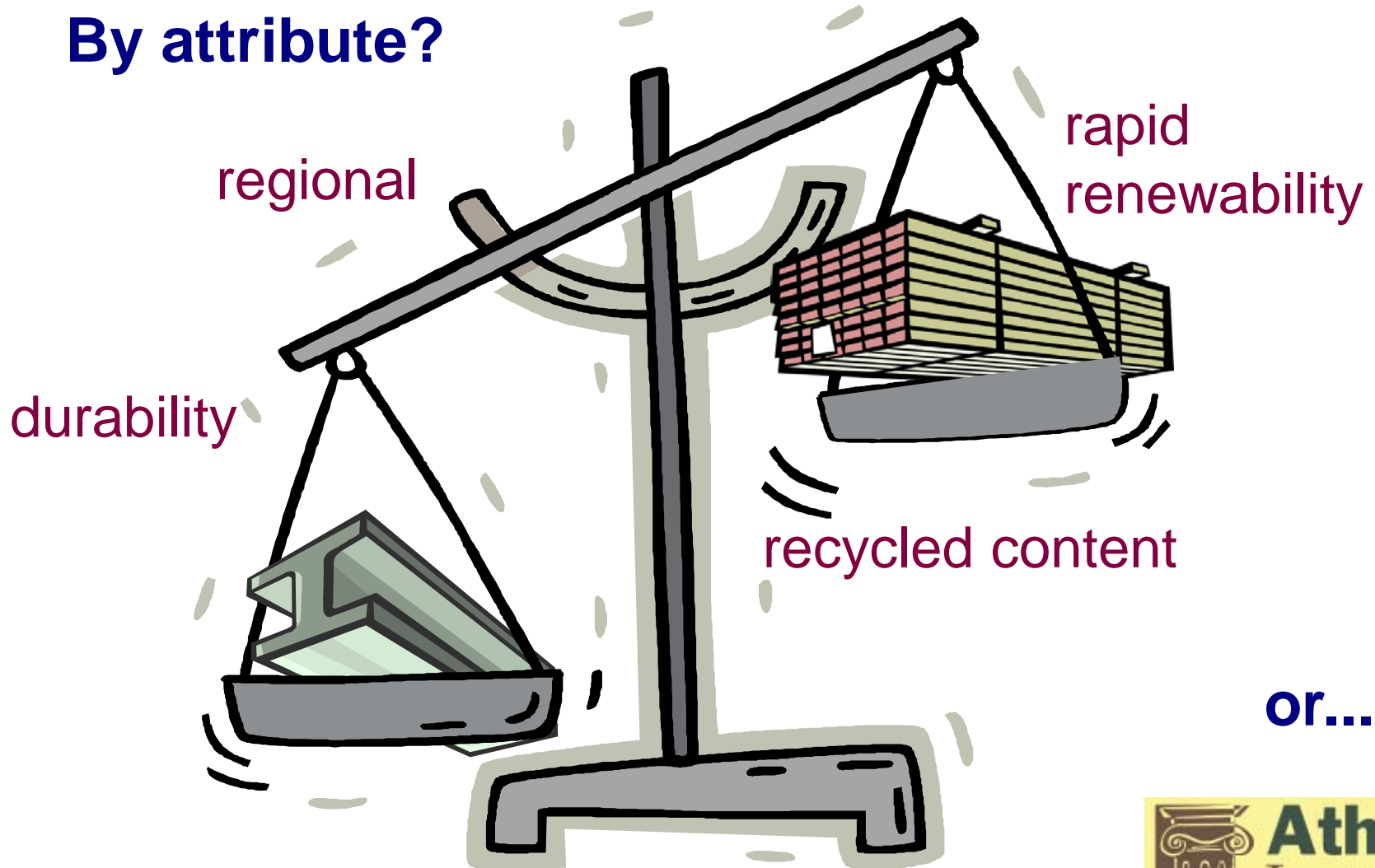


Putting Labels in Perspective



Weighing material options

By attribute?



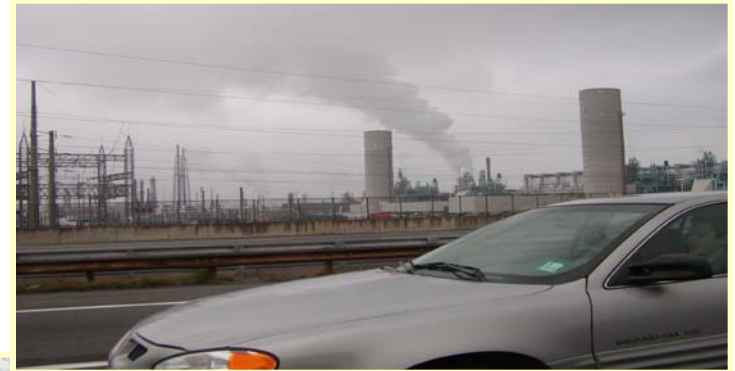
or...

By environmental performance → LCA

Acid rain damage



Air pollution



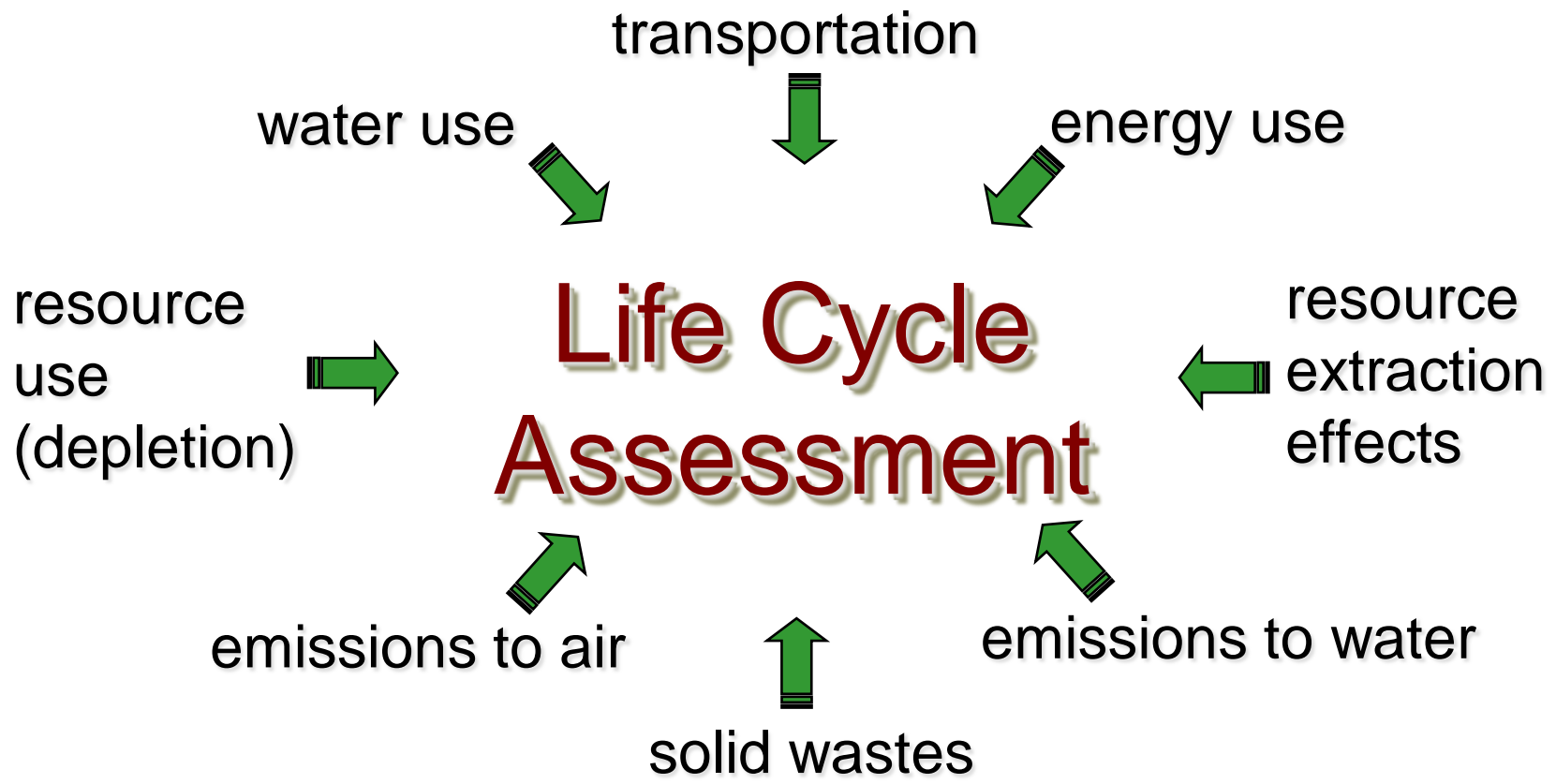
Resource depletion



Climate change



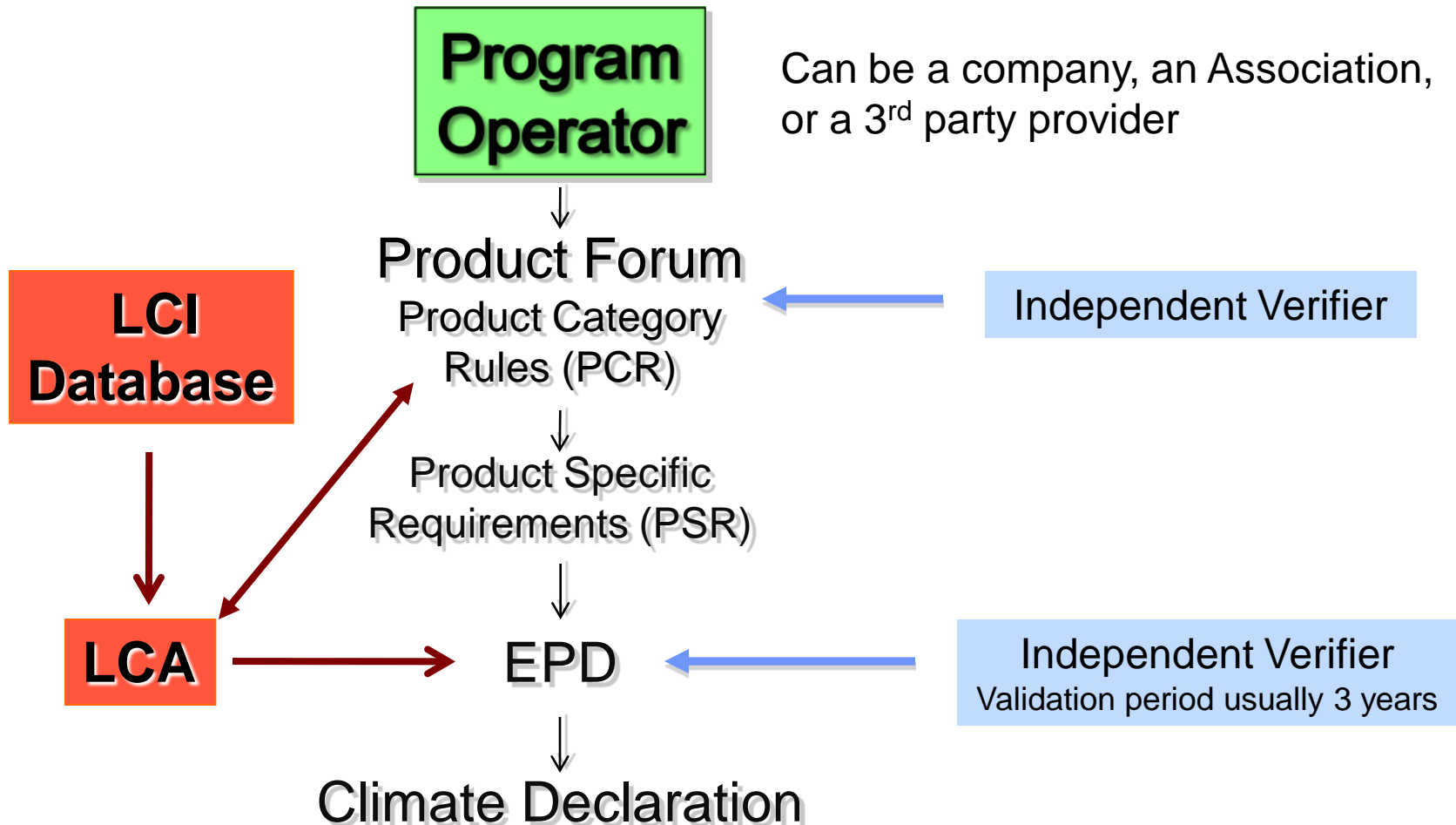
Water pollution



A methodology for assessing the environmental performance of a product over its full life cycle

LCA-based EPDs emerging as the dominant label

EPD Process



Coming soon to a code or standard near you...

- ◆ GBI/ANSI Standard 01-2007P: *Green Building Assessment Protocol for Commercial Buildings*
- ◆ ASTM: *Minimum Attributes of a Building that Promotes Sustainability*
- ◆ NAHB/ICC700: *National Green Building Standard™*
- ◆ ASHRAE/USGBC/IESNA Std 189: *High-Performance Green Buildings*
- ◆ ICC green building code (IgCC)
- ◆ California Green Building Code
- ◆ ASTM: *Product Category Rules for Environmental Declarations for Building Products and Systems*

LCA in the U.S. rating systems

Green Globes

- ◆ Adopted assembly ranking approach
- ◆ GBI funded prototype tool ➔ ATHENA EcoCalculator
 - points based on performance relative to benchmarks for each of several measures (e.g., global warming potential)
- ◆ Included in Green Globes ANSI standard

LEED

- ◆ Also adopted assembly ranking approach
- ◆ Using ATHENA EcoCalculator as basis for credit calculator
 - same basic approach to allocating points



Athena Institute

The Athena Institute – unparalleled excellence in fostering a sustainable built environment

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- [EcoCalculator](#) ▶
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WELCOME

At the Athena Institute, we believe that better information and tools are critical to achieving a sustainable built environment. We also believe that a life cycle assessment (LCA) approach to sustainability is the only way to create a level playing field for the vast array of building materials in use.

From our Canadian offices, and through our US affiliate, Athena Institute International, the not-for-profit Athena organization undertakes and directs innovative research and development activities that allow architects, engineers and others to factor environmental considerations into the design process from the conceptual stage onward.

Over the past decade, the Institute has developed groundbreaking software, world-class databases and

www.athenaSMI.org



U.S. Life Cycle Inventory Database Roadmap

The National Renewable Energy Laboratory (NREL), a facility of the US Department of Energy, has released a new Roadmap for the US Life Cycle Inventory Database.

Click [here](#) to download the brochure.

Important update released Oct 2009 (Version 4.0.64). Click [here](#) to download.

Click [here](#) to see what's new in Version 4!



Provides instant LCA results for more than 400 common building assemblies (free of charge).

Version 3.3 is now available!

Award Winning Tool

Since its launch in July, 2007, the EcoCalculator has been recognized with awards for innovation from both the US Environmental Protection Agency (EPA) and the Sustainable Buildings Industry Council (SBIC).



First Athena Chair in L.C.A.

The Athena Institute is pleased to report that the position of Athena Chair in Life Cycle Assessment at the University of Calgary has been filled. [More.](#)



Important New Study

This study, recently completed for Parks Canada, compares the effects of keeping historic buildings as opposed to building new structures in the same locations. [More.](#)



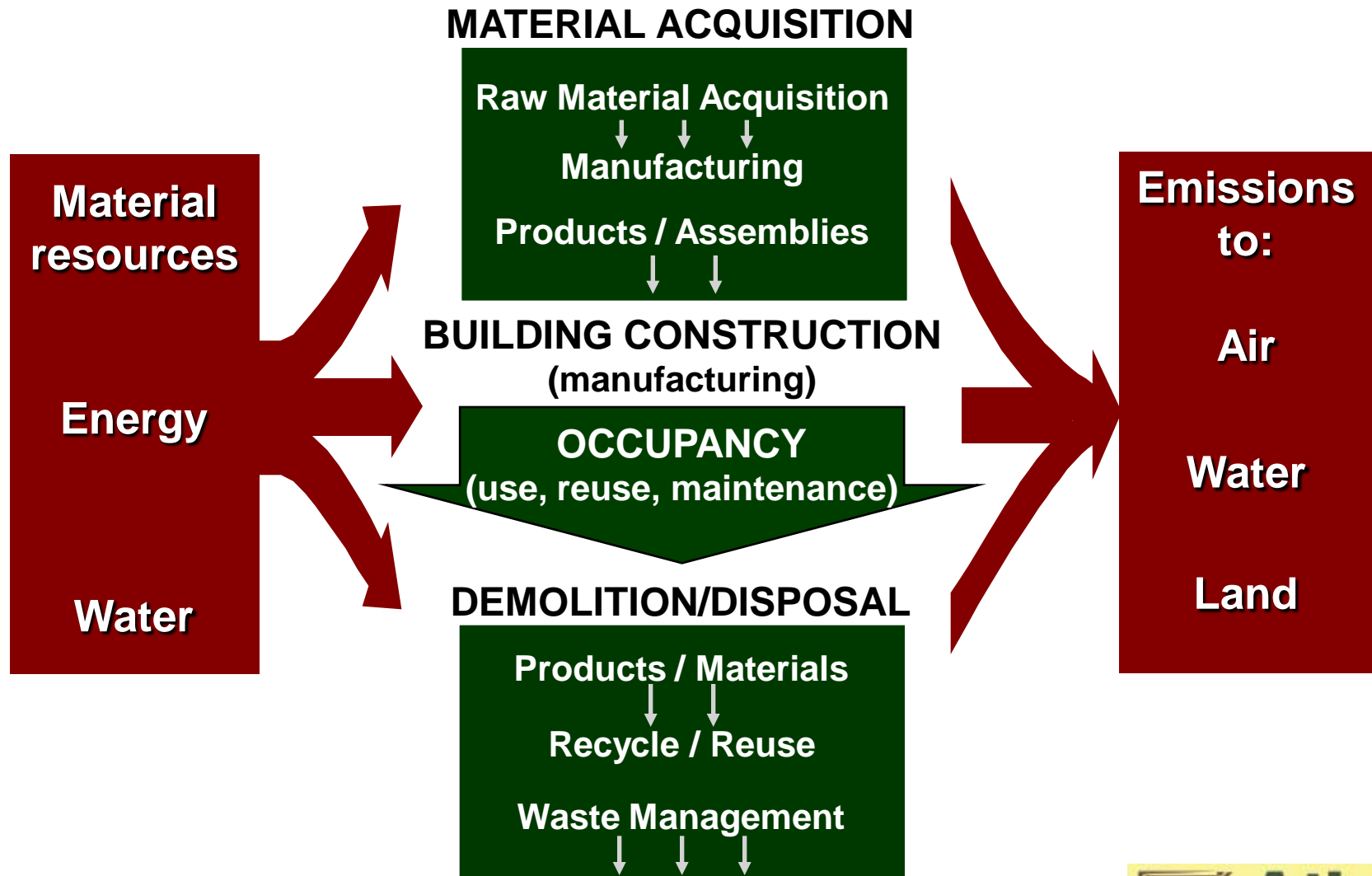
Thank you . . .



A photograph of a modern, two-story house with a light-colored exterior and a dark roof. The house features a two-car garage on the left, a central entrance with a white door, and a second-story balcony. The front yard is landscaped with a concrete driveway, a stone retaining wall, and various plants and flowers. The sky is clear and blue.

LCA in Relation to Buildings

Tracking Flows: The Inventory Step



Assessing Impacts

Inventory



Impact Indicators



- fossil fuel depletion
- global warming potential
- ozone depletion
- ground level ozone (smog)
- acid rain
- toxic releases → air/water/land
- etc.

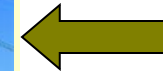
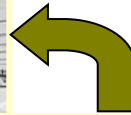
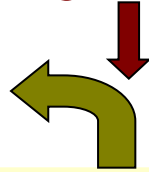
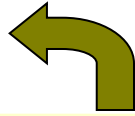
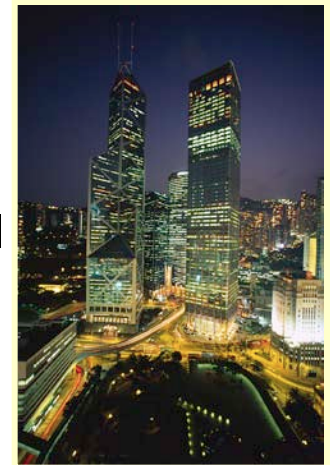
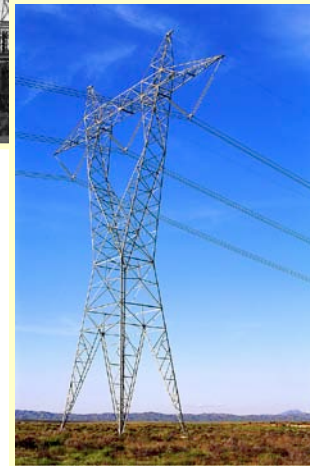
Impact Assessment (Valuation)

THE GOAL: to measure ultimate impacts on human and ecosystem health

In the case of energy...

Even source energy doesn't get it all

End use energy estimates just one part of the story



The rest of the story is the energy to make and move energy — called pre-combustion in LCA