

Building LCA Capacity through Curriculum at Community Colleges



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InLCA/LCM 2007

Develop a Program in Clean Technology, **including LCA**



- Partnership between IERE & South Seattle Community College (SSCC)
 - Highly diverse student body
 - 44% of students speak English as second language
 - High labor representation: largest apprenticeship program in the state



Economic sectors with programs at South

- **Electricians**
- **Transportation**
- **Horticulture & hospitality**
- **Building Trades**



Economic sectors having greater environmental impacts

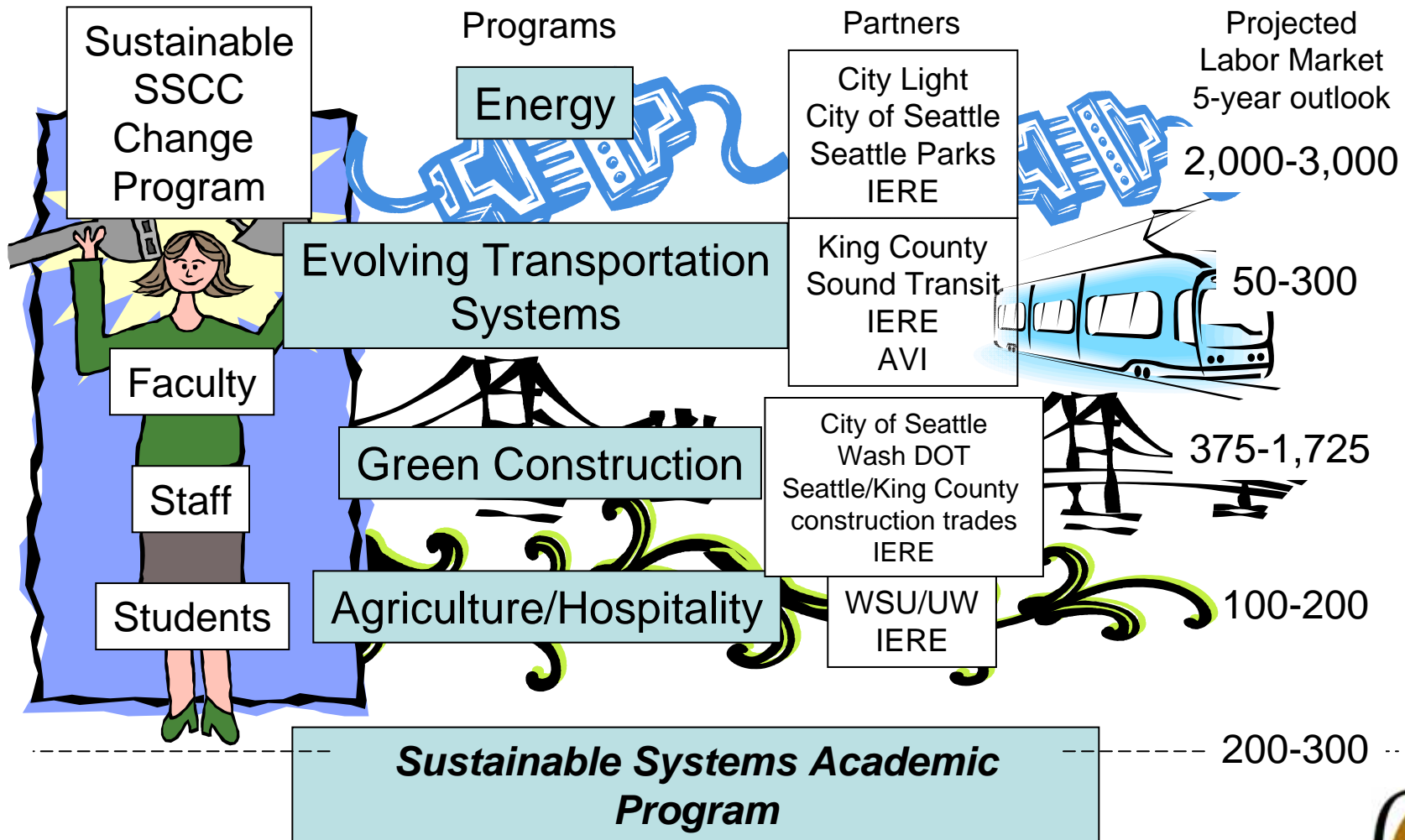
- **Energy**
- **Transportation**
- **Agriculture/
Silviculture**
- **Buildings**



Seattle Area 5-year Clean Technology Job Outlook

Sustainability Management Business & Government	200 – 300
Energy Auditors, insulation & weatherization contractors, HVAC, wind turbine & solar installation & maintenance	2,000 – 3,000
Emerging Transportation Install & operate light rail, maintain plug hybrids, gas hybrids	50 - 300
Green Construction Install clean technology in new & renovated buildings	325 - 1725
Horticulture & Hospitality Sustainable Ag, environmental management of restaurants & hotels	100 - 200
Total	2,675 - 5,525

SSCC Clean Technology Program



Sustainable Systems 2-year degree

- Teaches intensive systems thinking
- Open to all
- Triple bottom line orientation
 - People
 - Profits
 - Planet
- Developing a cadre that can measure sustainability using LCA *and* are change agents



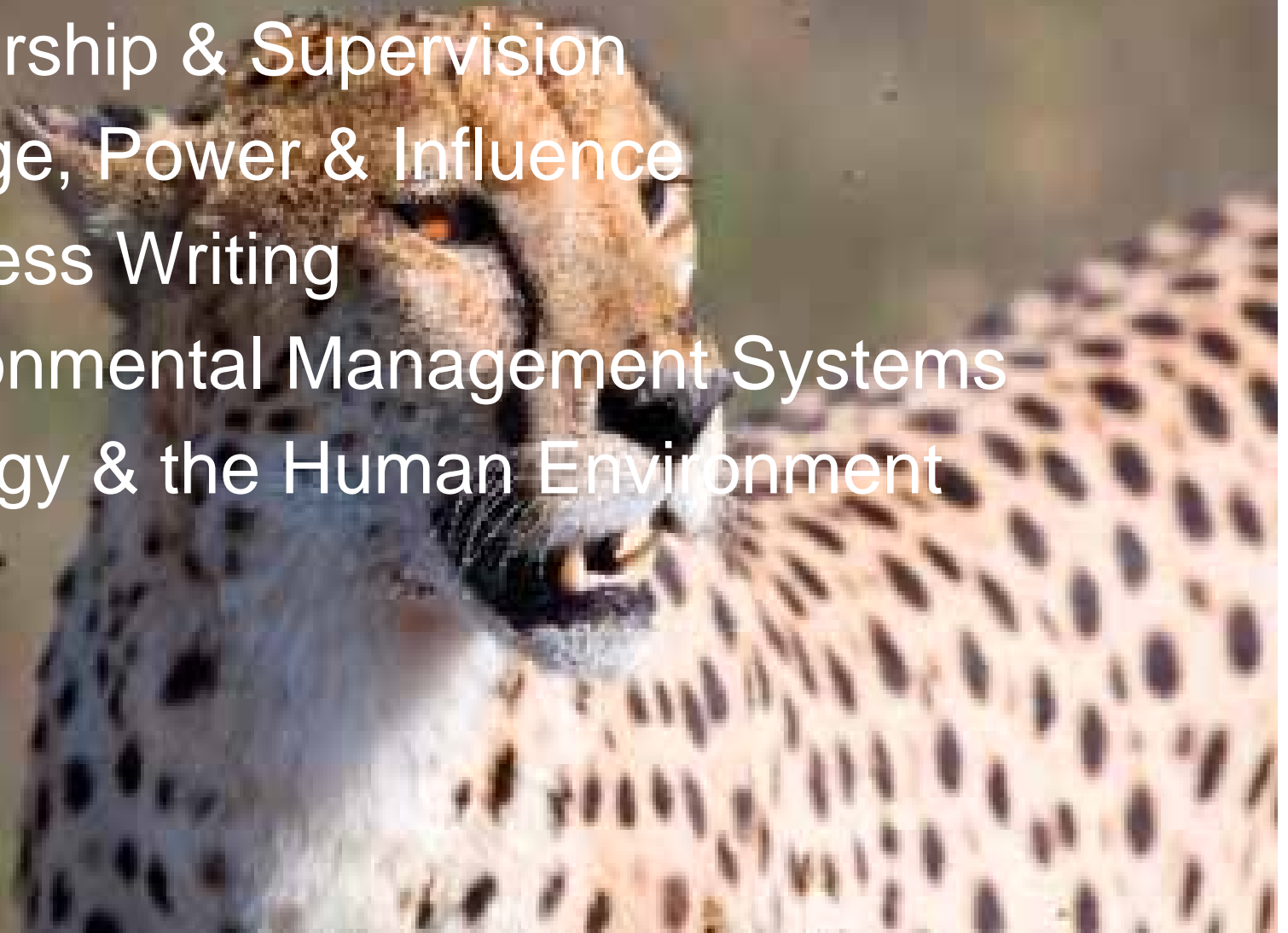
Systems Thinking

- Introduction to Sustainable Systems
- Systems Analysis
- Environmental Management Systems
- Life Cycle Assessment



People Skills Classes

- Leadership & Supervision
- Change, Power & Influence
- Business Writing
- Environmental Management Systems
- Geology & the Human Environment



Financial Classes

- Environmental & Total Cost Accounting
- Business Writing
- Life Cycle Assessment
- Geology & the Human Environment



Environmental Classes

- Geology & the Human Environment
- Chemistry & Biology
- Introduction to Energy & Water systems
- Introduction to Toxicology
- Environmental Sampling & Statistics



LCA I (55 contact hours)

Introduction to Life Cycle Assessment

- The Concept of system function
- System boundaries and cutoff rules
- Residential Energy Supply and Use
- Centrality of energy use
- Impact Assessment

Types of LCA's

- ISO compliant LCA's
- Economic input-output LCA's
- Cradle to gate, cradle to grave and gate-to-gate analyses
- Modulation of energy use

Uses of LCA

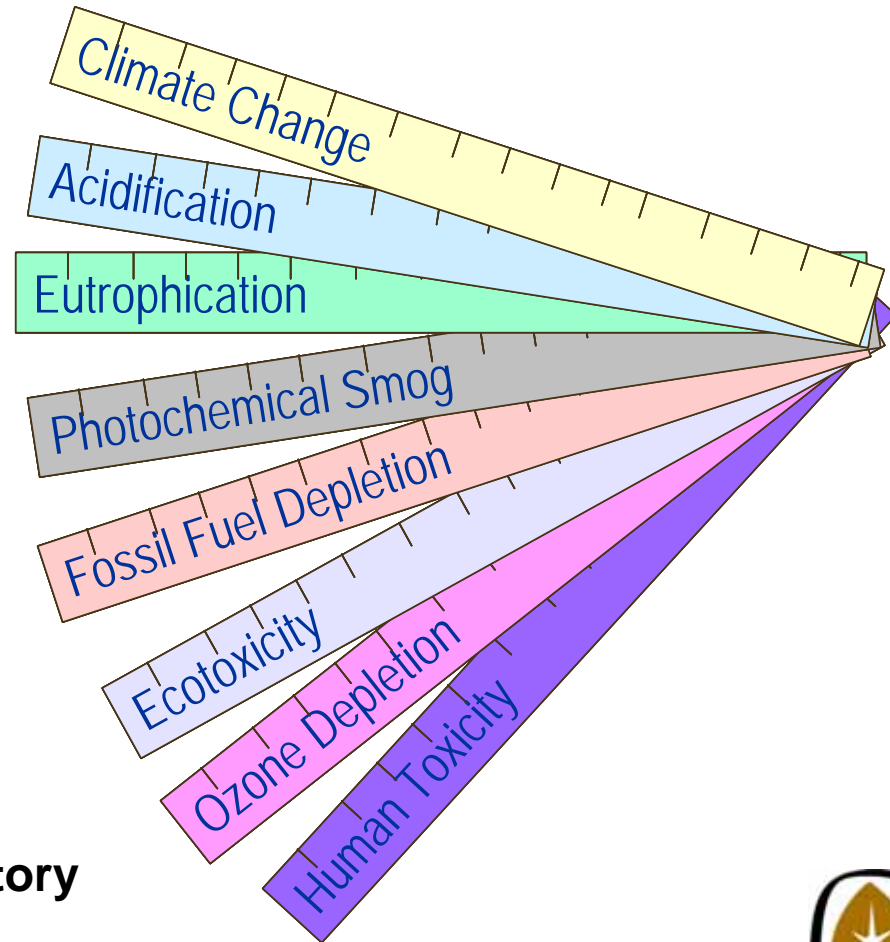
- Policy
- Cleaner Production
- Marketing advantage
- Green Buildings
- Vendor management

Concepts of LCA

- The Unit Process
- Ecosphere/technosphere transfers
- Considering species and sustainability
- Ethics in LCA

Creation of a Unit Process inventory

- Gathering data on the web
- BEES



LCA II (66 contact hours)

Data Formats

- Ecospold
- ISO standard for data transfer
- Chemical Abstracts Numbers
- Renewable energy and bioenergy conventions
- Units for impact indicators

LCA Software

- Gabi
- Simapro
- BEES, GREET and other free programs
- EIO software

Data Sources

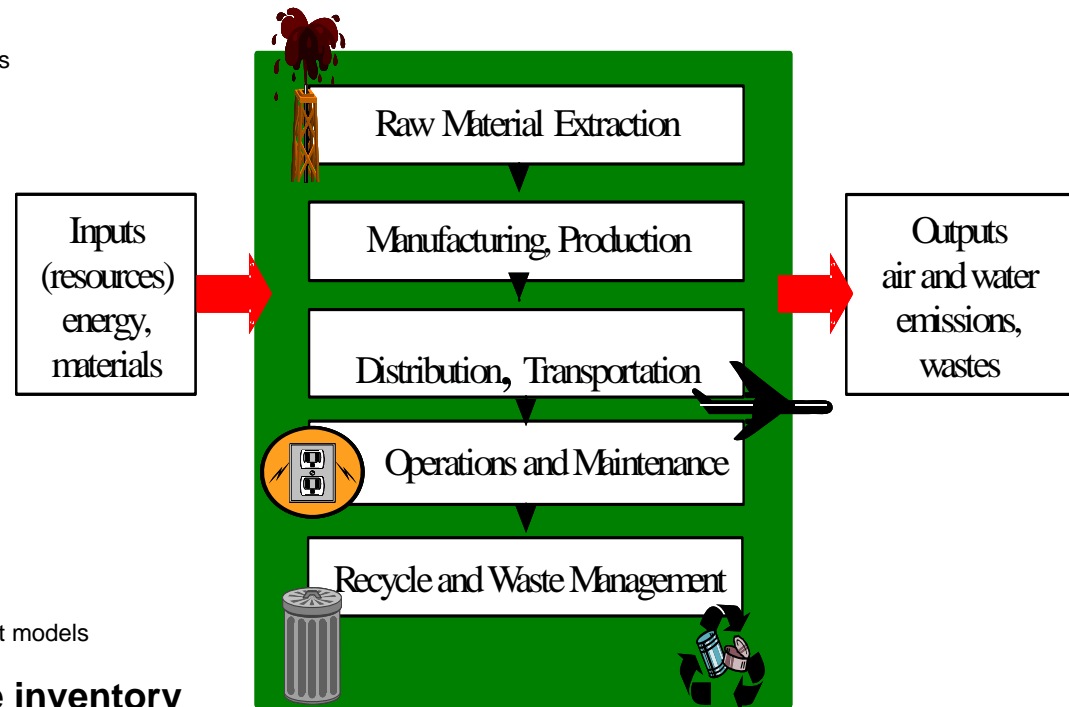
- National databases
- Published literature
- BUWAL
- Data quality considerations

Impact Assessment

- Concepts of indicator systems
- Intergovernmental Panel on Climate Change
- TRACI
- Considerations for use & elimination of impact models

Group Effort: Creation of a Life Cycle inventory

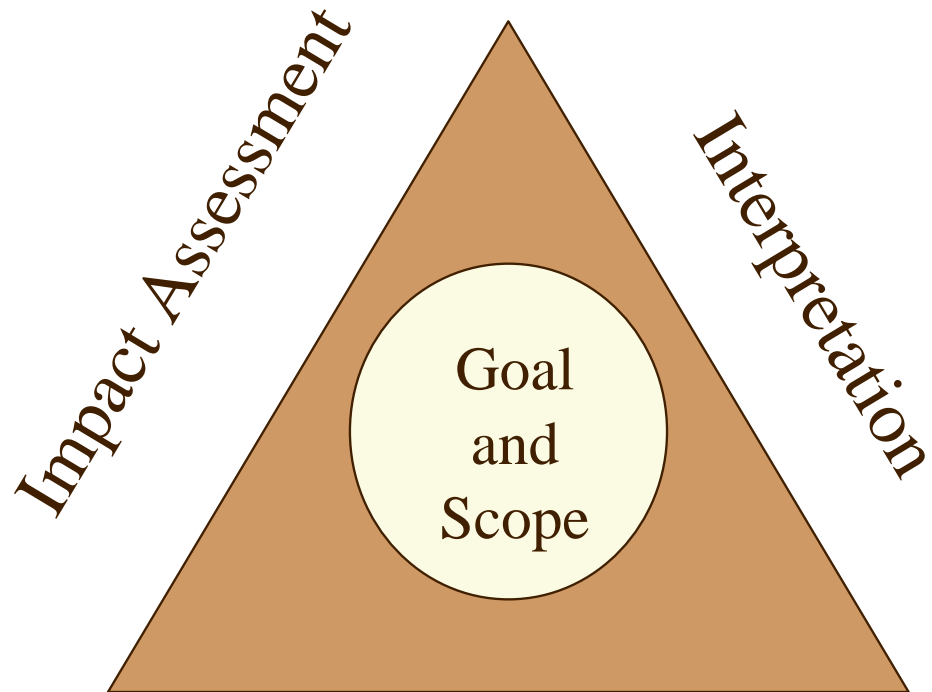
- Gathering and verifying data on the web
- Gathering data from published datasets
- Gathering Primary Data
- Calculating the Carbon footprint
- Presentation of results



Industrial System

LCA III (77 contact hours)

- Group LCA Projects
 - Work with local businesses:
Choose & scope LCA project
 - Setting systems boundaries
- Gather Data for LCI
 - Collect data
 - Peer review data/data quality assessment
 - Filling data gaps
 - Data reporting
- Perform LCI
 - Include modeling of sensitivity
 - Monte Carlo analysis and other statistical treatment
- Perform LCIA
- Data display and analysis
 - Data sorting
 - Comparisons between scenarios
- Write report



Inventory Analysis

Next Steps

- Will coordinate curriculum with LCA certification efforts
 - Is this really what LCA professionals need to know?
- Nonacademic curriculum will be required for all union apprentices in Washington State

