國立臺北大學自然資源與環境管理研究所

108 學年度第二學期『清潔生產與工業生態』

課程進度(12~13)：生命週期評估、投入產出生命週期評估
Life Cycle Assessment and Economic Input-Output Life Cycle Assessment

- LIFE CYCLE ASSESSMENT (G&A, Chap.12-14)
  - □ Product Lifecycle
    - ⇨ From-Cradle-to-Grave; From-Cradle-to-Gate
    - ⇨ From-Gate-to Gate; From-Cradle-to-Cradle
  - □ The LCA Framework
    - ⇨ Brief History of LCA
    - ⇨ The SETAC Framework and the ISO-14040 Framework
  - □ LCA Phases
    - ⇨ Goal and Scope Definition
    - ⇨ Life Cycle Inventory Analysis
    - ⇨ Life Cycle Impact Assessment
    - ⇨ Interpretation
  - □ Boundary Definition
  - □ Data Acquisition
  - □ The LCA Impact and Interpretation Stages
    - ⇨ Classification, Characterization, Localization, (Normalization), and Valuation
    - ⇨ Prioritization and Weighting
    - ⇨ Eco-Indicator, Eco-Point, Weighting Schemes…
    - ⇨ Interpretation Analysis
  - □ Streamlining the LCA Process
    - ⇨ The Assessment Continuum
    - ⇨ Comprehensive LCA vs. Streamlined LCA or Simplified LCA
    - ⇨ Preserving Perspective
    - ⇨ Life Cycle Thinking and Life Cycle Management

- LIFE CYCLE ASSESSMENT AND STREAMLINED LCA (Reddy, Chap.9-10)

- ECONOMIC INPUT-OUTPUT LIFE CYCLE ASSESSMENT (Reddy, Chap.11)
  - □ Economic (Monetary) Input-Output Analysis (EIO)
    - ⇨ National Financial Accounts (NFAs)
    - ⇨ Wassily Leontief => Leontief inverse
  - □ Economic Input-Output Life Cycle Assessment (EIO-LCA)
    @Green Design Institute, Carnegie Mellon University
    - ⇨ http://www.eiolca.net/index.html
    - ⇨ http://www.eiolca.net/Method/eiolca%20math.pdf

- UPDATE OF ISO 14040 SERIES STANDARDS (TC-207 SC5)
  (https://www.iso.org/committee/54854/x/catalogue/p/1/u/0/w/0/d/0)
  - □ ISO 14040:2006 and ISO 14044:2006 (14040:1997; 14041:1998; 14042:2000; 14043:2000)
    - ⇨ ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework

- ⇨ ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ⇨ ISO 14044:2006/AMD 1:2017 – Amendment 1
- ⇨ ISO 14045:2012 Environmental management -- Eco-efficiency assessment of product systems -- Principles, requirements and guidelines
- ⇨ ISO 14046:2014 Environmental management -- Water footprint -- Principles, requirements and guidelines

□ Technical Specification (TS) and Technical Report

- ⇨ ISO/TR 14047:2012 Environmental management -- Life cycle assessment -- Illustrative examples on how to apply ISO 14044 to impact assessment situations
- ⇨ ISO/TS 14048:2002 Environmental management -- Life cycle assessment -- Data documentation format
- ⇨ ISO/TR 14049:2012 Environmental management -- Environmental management -- Life cycle assessment -- Illustrative examples on how to apply ISO 14044 to goal and scope definition and inventory analysis
- ⇨ ISO/TS 14071:2014 Environmental management -- Life cycle assessment -- Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006
- ⇨ ISO/TS 14072:2014 Environmental management -- Life cycle assessment -- Requirements and guidelines for organizational life cycle assessment
- ⇨ ISO/TR 14073:2017 Environmental management -- Water footprint -- Illustrative examples on how to apply ISO 14046

□ Other 14040 Series Standards under Development

- ⇨ ISO 14040:2006/DAMD 1 – Amendment 1 to ISO 14040
- ⇨ ISO 14044:2006/DAMD 2 – Amendment 2 to ISO 14044
- ⇨ ISO/AWI TS 14074 Environmental management -- Life cycle assessment -- Principles, requirements and guidelines for normalization, weighting and interpretation

PWI: Preliminary Work Item
NP / NWIP: New Proposal / New Work Item Proposal
AWI / WD: Approved Working Item / Working Draft

CD: Committee Draft
DIS: Draft International Standard
FDIS: Final Draft International Standard