USE OF LCI DATA IN THE CONSTRUCTION OF ECOLOGICAL INDICATORS FOR REGIONS

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http://www.ymparisto.fi/eng/research/euproj/ecoreg/ecoreg.htm
CONTENTS OF THE PRESENTATION

- aims of the ECOREG project
- regional metabolism
- assessing ecological indicators
- LCI data in the regional environmental analysis
- data quality issues
ECOREG PROJECT

“The Eco-efficiency of regions – case Kymenlaakso”
- started in the autumn 2002, finished in the end of 2004

Main aims of the project:
- to demonstrate the concept of eco-efficiency and its practical implementation at the regional level by using the Finnish Kymenlaakso region as a case study
- to define economic, ecological and social & cultural indicators for assessing the development of regional eco-efficiency in general and especially in Kymenlaakso
Regional metabolism

Upstream processes
Imports, RoF
Imports, RoW

Regional processes

Exports, RoF
Exports, RoW

Outputs into nature:

Legends:
RoF = the rest of Finland,
RoW = the rest of the world

Figure: Matti Melanen & Tuuli Myllymaa
Regional metabolism

Upstream processes

Angles:
- economic value
- environmental impacts (rough view)

Imports, RoF
- raw materials
- refined products

Imports, RoW
- raw materials
- refined products

Regional processes

Angles:
- economic value (value added)
- environmental impacts (detailed view)
- social and cultural development

Inputs from Kymenlaakso:
- biomass
- soil
- minerals

Outputs into nature:
- emissions into air
- emissions into water
- waste materials

Downstream processes

Angles:
- economic value

Exports, RoF
- raw materials
- refined products

Exports, RoW
- raw materials
- refined products

Legends:
RoF = the rest of Finland, RoW = the rest of the world

Figure: Matti Melanen & Tuuli Myllymäki
MEASURING INDICATORS FOR REGIONAL ECO-EFFICIENCY

**Social and cultural indicators**
- National indicators for sustainable development

**Ecological indicators**
- Regional environmental analysis

**Economic indicators**
- Monetary and physical input-output tables

- Ecosystems
- Natural resources
- Social welfare
- Culture

- Economic welfare
- Production

Resource types:
- Natural resources
- Social welfare
- Cultural
ECOLOGICAL INDICATORS FOR REGIONS

Environmental analysis

Inventory
Interventions by the economic sectors

LCIA
Weighting of environmental problems by local actors

Selection of indicators

Calculation of indicators

Emission and statistical data

at 5-year interval
annually
AN EXAMPLE OF A PRODUCT CHAIN

UPSTREAM

Timber
Chemicals
Fuels
Electric power

KYMENLAAKSO PROVINCE

Pulp and paper industry

Heat
Chemicals
Timber

DOWNSTREAM

Products

Transport
LCI DATA IN THE ENVIRONMENTAL ANALYSIS

Regional processes

- data gathered per the **total annual production volume** of each economic sector: e.g., agriculture, forestry, industry, transportation, communities
- public statistics and databases maintained by environmental authorities
- site-specific and generic data
LCI DATA IN THE ENVIRONMENTAL ANALYSIS

Upstream processes

- Import: main products, raw materials or natural resources pertaining to economic sectors
- Generic LCI data, diverse LCI databases
- Finnish average electricity model
DATA QUALITY ISSUES IN THE REGIONAL INVENTORY

- The data quality of the conventional emissions from point sources is good.
- Estimations of the emissions from diffuse sources, toxic pollutants and land use interventions include large uncertainties.
- All regional LCI results will be verifiable and reproducible.
- Documentation will be transparent, updating the regional inventory will be possible.
ISSUES TO BE STUDIED IN THE FUTURE

- available international databases
- data quality assessment
Thank you for your attention!