

# Environmental Labelling of Green Electricity with Key Parameter Models

**Dr. Niels Jungbluth**  
**Dr. Rolf Frischknecht**  
**ESU- services, Uster**



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# Problem Setting

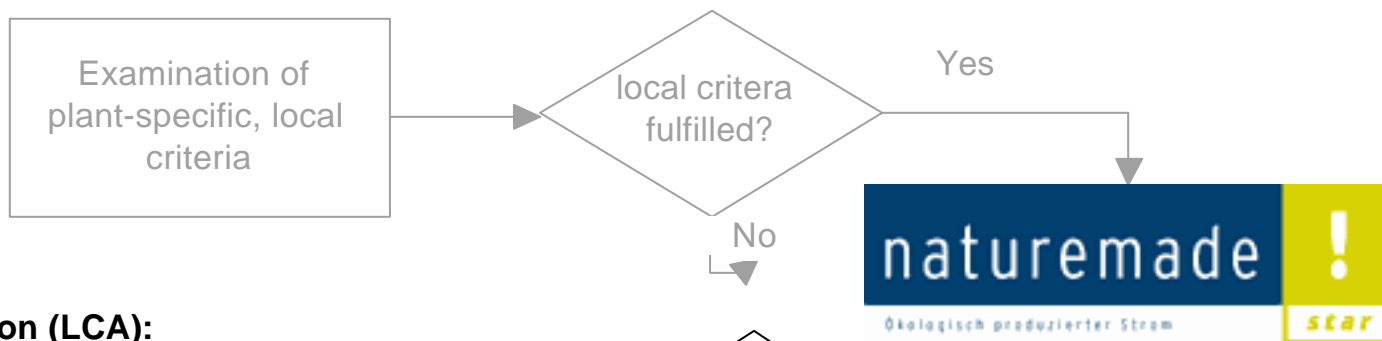
- Opening of electricity markets
- Consumers want to buy environmentally friendly electricity with good ecological criteria
- How can LCA contribute to this kind of question?

# Contents

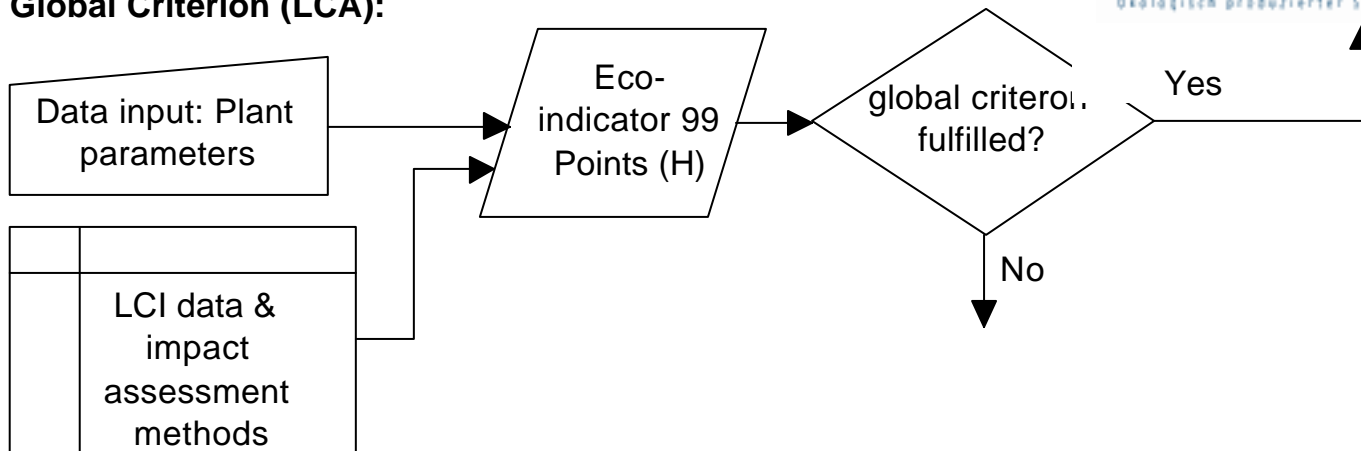
- Labelling scheme
- Rule of LCA and an example
- Consistent system boundaries and other challenges
- Conclusions and outlook

# Criteria for Ecolabelling

## Local Criteria:



## Global Criterion (LCA):



# Detailed LCA for Electricity Production from Wood

- Detailed inventory for three Swiss plants
- Cradle to grave
- Assessment with Eco-indicator 99 and other impact assessment methods
- Analysis of most important stages as entries to the inventory

# Key Parameter Model

## Key parameter model for wood

### Name of facility

WKK Lengwil

### Impact assessment method

EI'99-aggregated, Hierarchist

### Type of plant

WKK Holz mit Multi-Zyklon

### Data input

Wood chips from forest

t/a

2556

Wood chips from wood processing

t/a

Wood chips from wood wastes

t/a

Transport distance

km

### Emissions to air

Particle

mg/Nm<sup>3</sup>

50.0

NOx as NO2

mg/Nm<sup>3</sup>

150.0

Lead (only for waste wood)

mg/Nm<sup>3</sup>

1.0

Cadmium (only for waste wood)

mg/Nm<sup>3</sup>

0.05

Zinc (only for waste wood)

mg/Nm<sup>3</sup>

0.5

### Outputs

Ash for waste management

t/a

3.05E+05

Type of waste management

Reaktordeponie

Gross electricity production

kWh/a

2.58E+05

Heat used

kWh/a

2.58E+05

### Results

WKK Lengwil per year

EI-99-points

WKK Lengwil / kWh

EI-99-points

Threshold Eco electricity Switzerland

EI-99-points

1.08E-03

0.0%

pro kWh

**Eco electricity criterion fulfilled**

# Threshold Limit

- Eco-indicator 99 (H) points
- 50% of a gas combined cycle power plant

		Certified Systems for Renewable Energy				Conventional Reference Systems				
Threshold Limit		Hydro Power	Wind Energy <sup>1)</sup>	Biogas <sup>2)</sup>	Photovoltaic <sup>3)</sup>	Gas Combined Cycle - Natural Gas	Nuclear Power	Fuel Oil	Hard Coal	UCPTE-Electricity-Mix
13'950	Min	367	1'160	neg.	6'730	27'900	6'260	61'600	28'000	24'600
	Max	637	9'680	neg.	14'900					

# Challenges

- Step by step evaluation of different systems. Start with wind, hydro and solar energy
- Consistent definition of system boundaries for new energy systems has to be ensured



# System Boundaries

- Development of guidelines
- Allocation of by-products → Credit with 50% of good conventional technique
- Average situation as reference standard

# Impact Assessment

- One score impact assessment is necessary in order to compare result with a threshold
- Shortcomings of Eco-indicator 99 are relevant for some (new) systems e.g. nutrients from biogas plant
- Local criteria cover specific problems of new systems (e.g. fish-ladders, visual impact of wind power, etc.)

# Concl usi ons

- Key parameter models are a valuable tool for plant specific evaluation
- Local criteria are indispensable to support the labelling

# Outlook

- Further case studies are on the way for biogas in agriculture, biogas from effluent treatment plants