
Renewable Energy & Energy Efficiency Promotion in International Cooperation

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Cleaner Production Centres as Network Elements

Examples of Biomass Energy from El Salvador and Costa Rica

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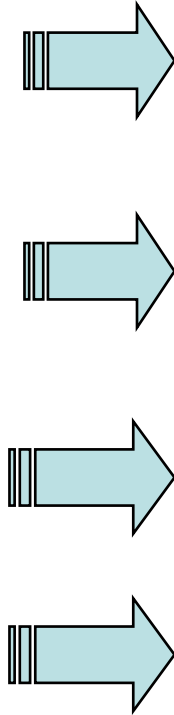
CP in brief

INPUT

Raw Material
 Auxiliary Material
 Energy
 Water
 Human resources
 Know-how

Optimize

Strengthen



OUTPUT

Minimize

Air emissions



High Quality Product



Minimize

Solid waste & waste water

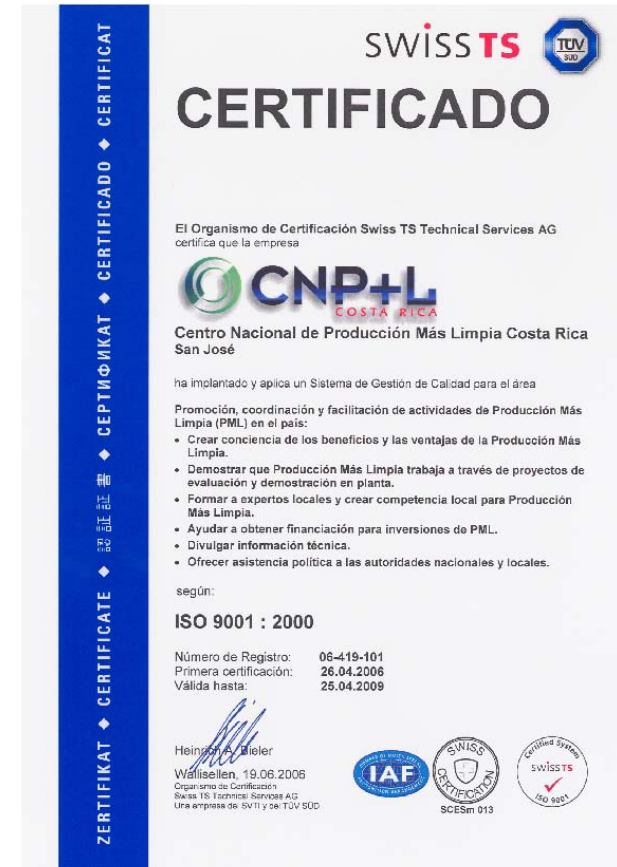
What is CP, what are CP-Centres and why do we need CPCs?

Cleaner Production is the continuous improvement of industrial processes, products and services to reduce the use of natural resources, to prevent - at the source - the pollution of air, water and land and to reduce waste generation in order to minimise risks to human population and the environment (UNEP 1994).

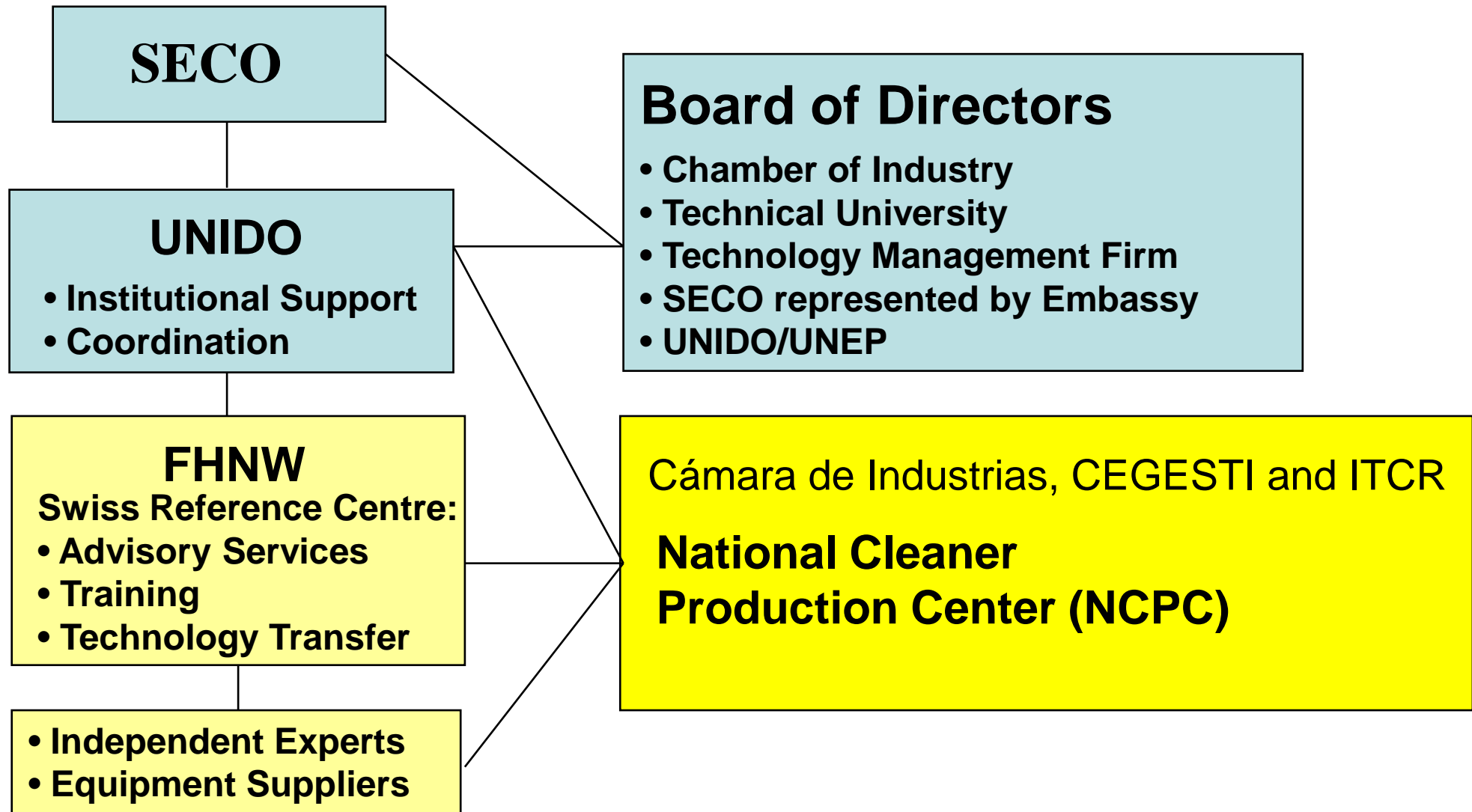
CP can only be sustained if capacity is in place to adopt and adjust it to local conditions. To make the CP programme a reality and promote the application of CP by enterprises in developing and transition countries, UNIDO started, in 1994, to set up National Cleaner Production Centres (NCPC) (UNIDO 2008).

43 NCPC have been established since 1994, mainly with the support by the Swiss and Austrian Government and in close cooperation with UNIDO

CP-Centres in Central America



Organisation of the former NCPC-Project - Costa Rica



Historic Events, El Salvador

The NCPC of El Salvador started its operation in 1999 as UNIDO projects funded by the Swiss Federal Government through SECO

During the first years of existence it was hosted by the Salvadorean Industrial Association (ASI), and later on by the Agro-Industrial Chamber of El Salvador (CAMAGRO)

In 2005 the CNPML became a “chartered corporation”

Current Projects of the NCPC in El Salvador

DONOR	Sector	Expected Results
Alianza, Energía y Ambiente	Porcine	Biomass- electric generator-
BMI/KFW	Agro-Industrial, Industrial & Service Industries	Technical Evaluations & Project Investment
BORSICA (CCAD)	Manufacturing and Service concerns	Recycling Exchange Board
CCAD	Dairy, Poultry and Porcine sectors	Cleaner Production Voluntary Agreements
REPIC Switzerland	Coffee Mills	Coffee Pulp Furnace Development
Organization Of American States (OEA)	Industrial Sector	Energy Efficiency
SAICM	Chemical Sector	Life Cycle Analysis Chemical Substances
World Environmental Center	Retail Food Market	Green Supply Chain
Chemonics	DR-CAFTA –Free Trade	Environmental & Labor Compliance

NCPC's services today

CPC are offering services in the field of eco-efficiency & sustainable development in the field of:

Technical assistance and In-plant Assessments

Training

CP Technology and investment promotion

Information dissemination

CP Policy advice

...and complementary services such as:

Corporate Social Responsibility

Life Cycle Assessments (LCA)

Clean Development Mechanism (CDM)

Risk assessments / risk management

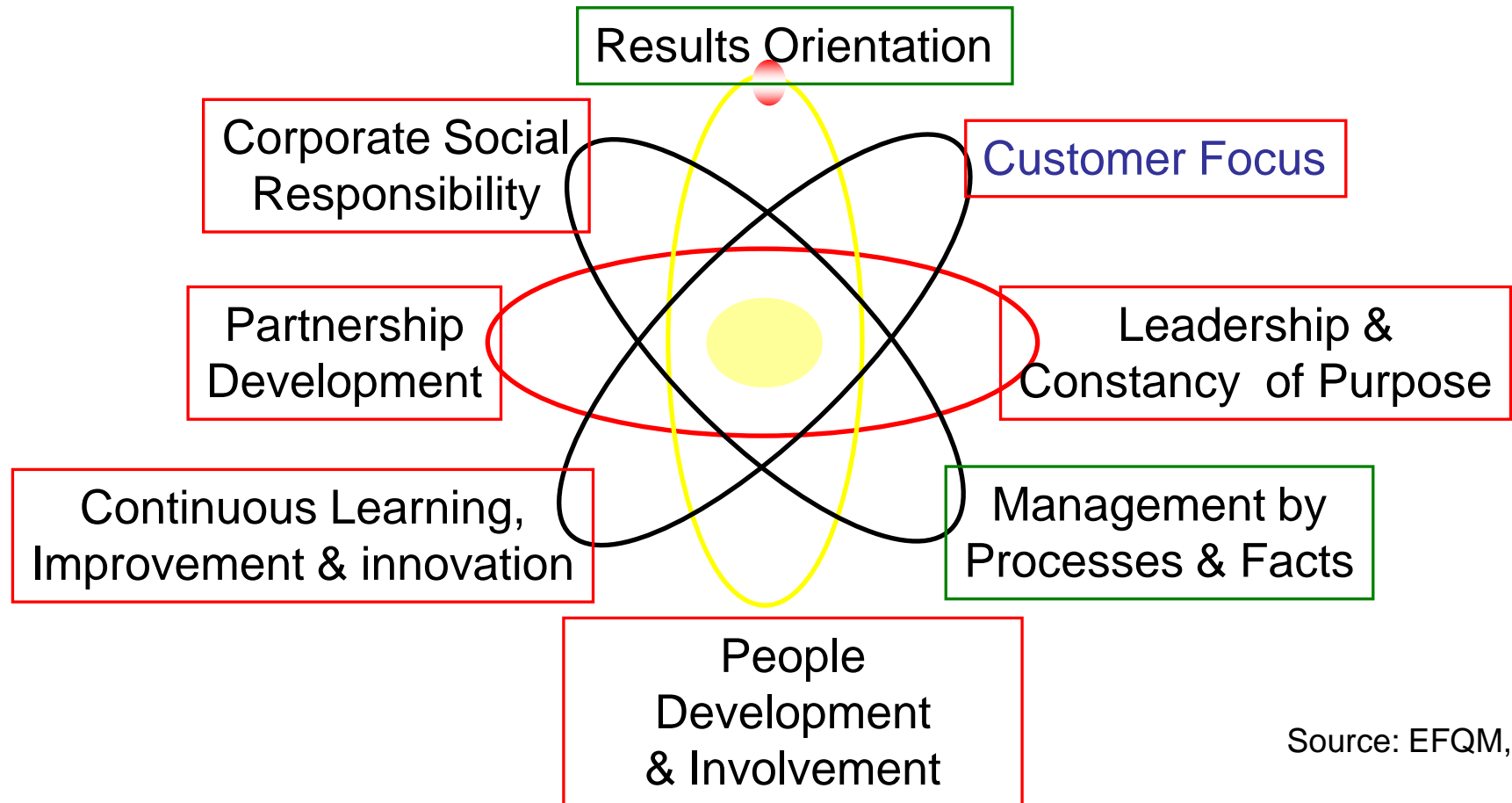
Integrated waste and wastewater management

Climate change

etc

Fundamental concept of excellence according to EFQM

... and the role of NCPCs



Source: EFQM, 2007

.... and NCPCs worldwide: **→** www.UNIDO.org/cp

Combustion of wet coffee pulp in El Salvador:



Background

Uncontrolled disposal of the coffee pulp leads to environmental problems

High energy demand for processing coffee

Cost pressure on small coffee producer due to low world market prices for coffee requires cheap and efficient solution



Demand for new robust technology

CP-Center El-Salvador contacted FHNW for an appropriate combustion technology

Ökozentrum Langenbruck and FHNW approached REPIC for financial assistance

Objectives of the project

Contribution to waste management

Reduction of methane emissions through uncontrolled disposal

Prevention of contamination of water resources

Production of process energy

Financial viability

Improvement of the competitiveness

Local production of the applied technology



Results achieved and lessons learnt

Results

Robust pilot burner successfully tested with wet wood chips (70% water content).

Burner ready to conduct tests with different biomass fuels with high water content.

NCPC has identified a local stove fitter, ready to built the burner in El Salvador on a commercial basis.

The unexpected combustion behavior of the wet coffee pulp needs further adaptation / modification of the burner.

Lessons learnt

Local demand for new technology/know how is the key to successful development cooperation projects (funding, technology, cooperation).

Coffee pulp has special (unexpected) combustion property – although chemical composition is very similar to wood: Further adaptation of the burner is required.

The developed technology could contribute to improved waste management and to the substitution of limited fire wood.

Tannin extraction and biogas production from banana waste in Costa Rica



Ernst **Basler + Partner**



Background

Huge amount of uncontrolled disposal of agro-industrial solid waste

Self commitment by private companies to reduce their carbon footprint

Costa Rica Costa intends to be the first carbon-neutral country of Latin America

New business opportunity: Commercialization of tannins

Further partners

Dole, University of Costa Rica

Ministry of Energy and Environment

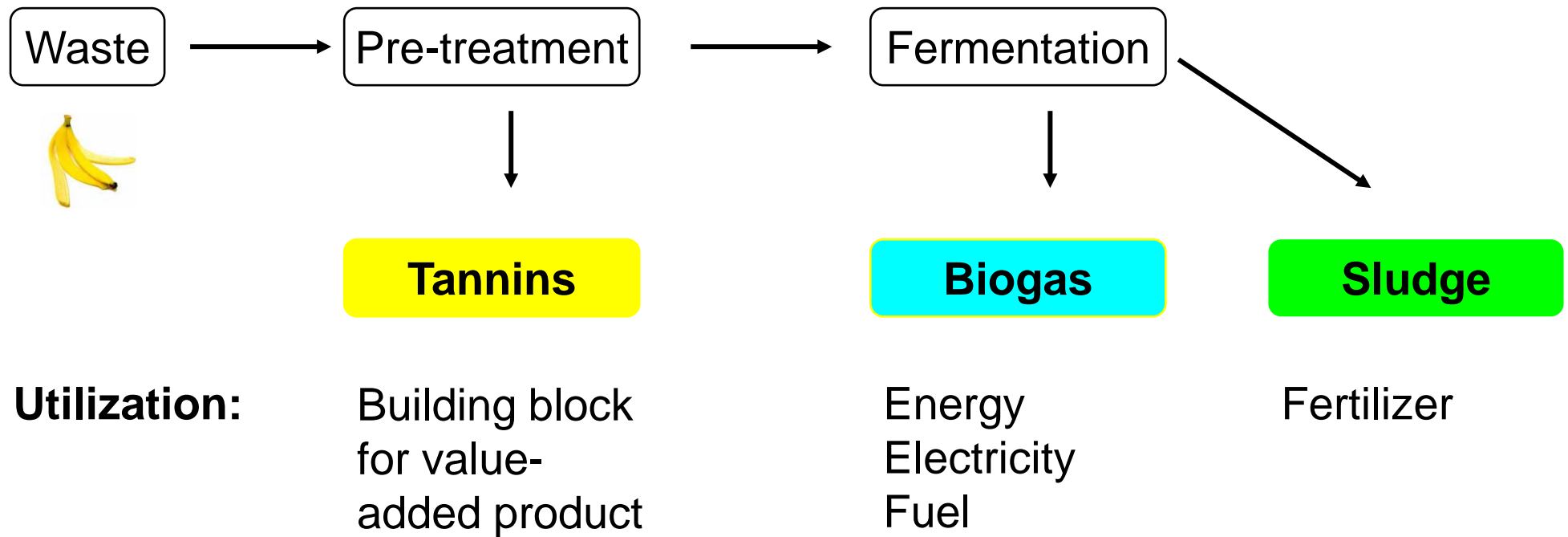
GTZ – Costa Rica, FHSO

Objective

Developing a concept and the technology to optimize the fermentation of agro-industrial wastes which are *a priori* not favorable for biogas production, taking banana peels as an example



Waste as resource



Results achieved and lessons learnt

Results

Good overview of waste quantities available

Pre-feasibility study confirms the expected financial viability of biogas production from banana waste

Tannin extraction and its impact on biogas production are behind expectations

Reduced willingness by the private sector to invest into a full-scale biogas plant due to the present financial crisis

Lessons learnt

Agro-industrial solid waste receives more and more attention in Costa Rica

The extraction of tannin will not have the expected commercial add-on benefit

Despite the given financial and ecological advantages partners need more time than expected to make final decisions

NCPC plays an important role in the national networking and in facilitating the communication between the public and the private sector

Thank you for your attention



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