

# Emerging Issue in Sustainability – INALCA Approach

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### **INALCA:** Sustainability Development - Scope and Definition



#### For INALCA

Sustainability development represents a corporate assets of knowledge, activities and industrial processes aiming to permanent control of production impact, consumption and setting of actions able to obtain their reduction in documented and measurable manner.

INALCA main guiding principles of Sustainable Development are:

- 1. Energy efficiency and energy self-production
- 2. <u>Internal renovable sources valorization</u>
- 3. Product Life Cycle Assessment improvement

Sustainable Development should represent a real instrument of competition strictly connected to the economic framework of the company.

### **INALCA PROCESSING**



#### **Deboning**

400.000 tons/year

#### Slaughtering

745.000 head/year



98.000.000 kW/h







#### **Products** (hamburger)

100.000 tons/year



#### **Technical advanced** products

20.000 tons/year



135.000 tons/year



# Process integration represent a significant strength point for sustainability

- Allowed better energy efficiency and variation of energetic sources;
- Consumption reduction for product unit;
- Consumption reduction for transport.

### **INALCA:** Energy efficiency and energy self production



INALCA HAS 4 PLANTS FOR
THERMAL AND ELECTRICAL
ENERGY SELF PRODUCTION
UTILIZING METHAN GAS AS FUEL



Energy efficiency	79	%		
Energy saving	2.005	TEP		
Energy requirement coverage	52,2	%		
Thermal energy production	3.950.000	Nm3 equivalente		
Electric energy production	51.194	MWh anno		
Installed electric energy	12,7	MW		



### Industrial Cogeneration is formally recognized as a «High efficiency system»



Allowed to valorize energy saving by national incentive system (so called **white certificates**)

### **INALCA**: Energy Efficiency



### WHITE CERTIFICATES (TEE)

### National scheme for energy efficiency incentivation

For achieve benefit related to energy efficiency are requested:

- Several energy measurement point for detailed analysis of consumption;
- Energetic Audit to Assure the optimization of energy savings;
- Knowledgement of the calculation scheme that must be approved by the competent Authority



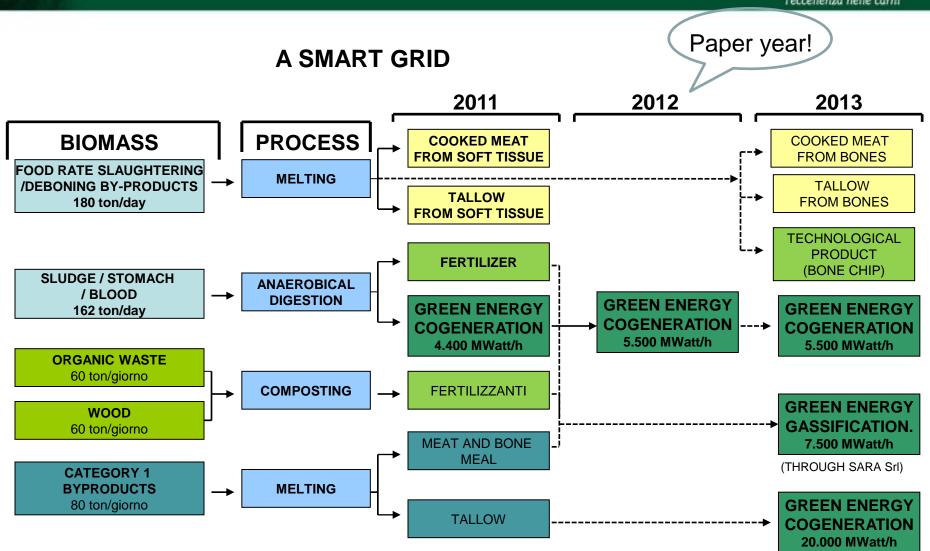
## INALCA utilize exclusively biomass intendend to elimination

For INALCA sustainibility is absolutely conflicting with exploitation of biomass potentialy destinated to food chain (i.e. corn, or palm oil for energy production)

Inalca consider as first priority saving its own food grade raw material whenever possible!

#### **INALCA:** Internal renovable sources valorization







First step: Ospedaletto Lodigiano (LO) Site



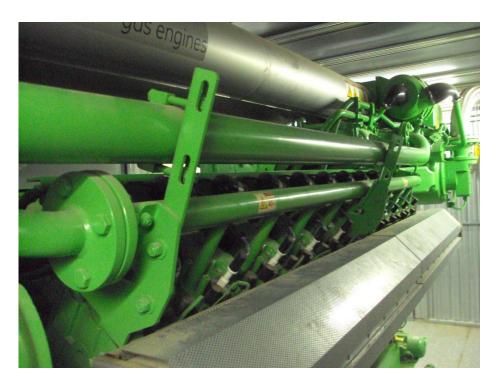








### **BIOGAS PLANT COGENERATION SYSTEM**







Anaerobic Digestion is based on a biologic process able to produce biogas. The biogas is a gas composed of Methan gas and Carbon dioxide.

The process is carried out without oxigen by methanigen bacteria Methan yield is variable from 50% to 80% of the digested organic biomass.

### Two main groups of Anaerobic digestion techniques

- -dry digestion, in case of biomass with a total solid content (ST value) around 20% of biomass
- -wet digestion, in case of biomass whit a total solid content (ST value) around 10% of biomass



#### **BIOGAS PLANT - KEY NUMBER**

BIOMASSE	Tons		SS %	, D	Ton SST	
FANGO di DEPURAZIONE	47.700		8%		3.800	
TANGO di DEI GNAZIONE	47.700		0 70		3.000	
STALLATICO	6.600		18%		1.200	
SANGUE	1.800		13%		230	
TOTALE	56.100				5.230	
Produzione Biogas		2.800.000 (1		(Nm3/	(Nm3/anno)	
Potenza cogeneratore		1.064		(kWel)		
Produzione energia elettrica anno		5.500 MWI		MWh		
Energia termica recuperabile anno		5.400 MWh				

TEP anno risparmiati	1.600		
ton CO2 anno non immessi in atmosfera	3.900		

### **INALCA:** Step 2 Melting process combinated with cogeneration



### New plants for melting and valorization of by products

INALCA has been kicked off authorization process for further two melting lines destinated to different categories of by products:

- 1) Exploit of 45.000 ton/y food rate by product (bones and soft tissues) in order to produce tallow, proteins and other technologic products (bone chip).
- **2) Treatment** of 20.000 ton/y by product destinated to disposal for production of 20.000 Mwh<sub>e</sub>/y.



### **INALCA:** Step 3 composting process development



### Nuovo impianto per il recupero e la valorizzazione agricole

- The actual INALCA composting plant is destinated to recicling of several external biomasses (ie sludges, wood, leafy branches, organic waste from town collection) and internal (ie digested products from biogas plant).
- At the moment the final product of composting process is destinated to agricoltural as fertilizer.
- The project is under authorization process in order to integrate the composting process with a gassification plant for energy production. the gassification process is related to a production of 7.500 mw<sub>e</sub>/y.



### **INALCA:** Step 3 composting process development

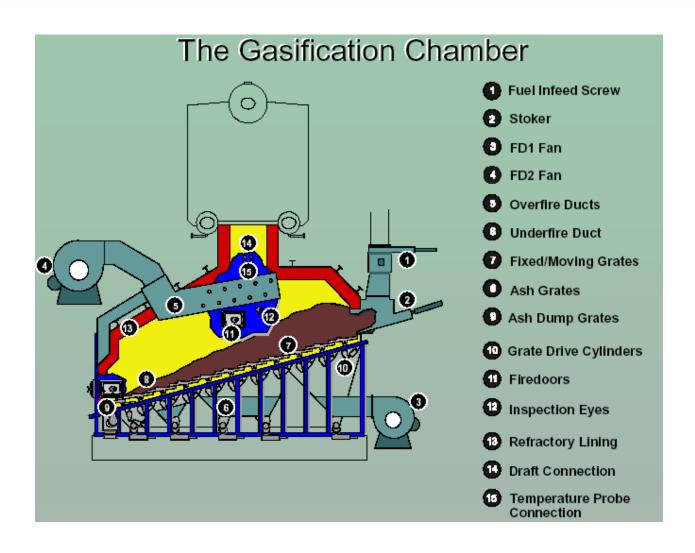


#### **COMPOST DESTINATED TO AGRICULTURE**



### **INALCA:** Step 3 composting process development





### INALCA: Green energy production plan



#### INALCA ELECTRIC ENERGY REQUIREMENT AND CARBON EMISSION

	20	2009 2010		2011		20	2012		2013	
ELECTRIC REQUIREMENTS INALCA - MWh/y	85.566		91.390		98.037		100.488		103.000	
ELECTRIC ENERGY PURCHASED - MWh/y	44.319	51,8%	40.323	44,1%	42.443	43,3%	43.794	43,6%	26.306	25,5%
ELECTRIIC ENERGY SELFPRODUCED BY FOSSIL SOURCE (Methangas - MWh/y	41.247	48,2%	48.567	53,1%	51.194	52,2%	51.194	50,9%	51.194	49,7%
ELECTRIC ENERGY SELFPRODUCED FROM RENOVABLE SOURCE (BIOGAS) MWh/y	0	0,0%	2.500	2,7%	4.400	4,5%	5.500	5,5%	5.500	5,3%
ELECTRIC ENERGY SELFPRODUCED FROM RENOVABLE SOURCES (COGENERATION & GASIFICATION) MWh/y									27.500	26,7%
ELECTRIC ENERGY CARBON EMISSION Ton/y	36.155		36.237		37.148		37.783		29.564	-29,9%
FE (ton CO2/MWh)	0,423		0,397		0,379		0,376		0,287	-24,3%

### **INALCA** Life cycle assessment



Life cycle assessment (LCA) is a methodology for studying environmental flows and potential impacts related to a product or service during all steps of its life cycle, from raw material to final disposal, including transformation, distribution and use steps.

Complying with ISO regulation 14040:2006, LCA represent a valid tool for:

- ➤ Valuating of potential environmental improvement of the product at each step of life cycle.
- Supporting decisioning process in the industry, GO and NGO.
- Selectioning of key indicator and supporting product environmental communication / MKT (i.e. EPD)

LCA techniques represent the mean instrument for evaluation and benchmark of the real company environmental performance

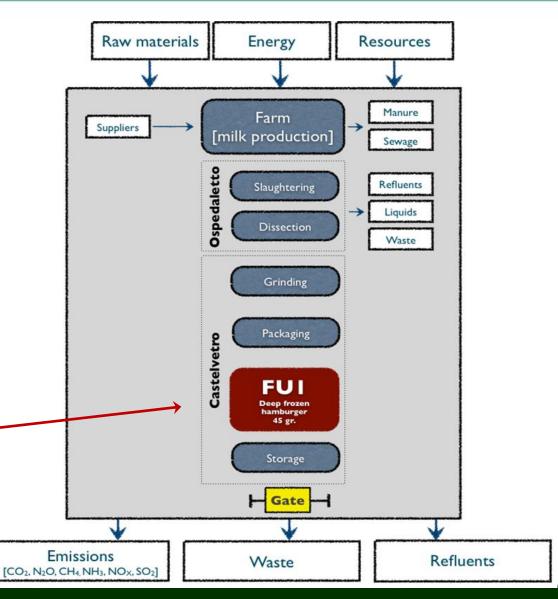
### **INALCA** Life cycle assessment - Project



Analysis of the environmental impacts of hamburgers in the life cycle stages included in the categories "cattle breeding stage" and "industrial stage".

(ISO 14040:2006)

Functional Units
Life Cycle
McD's 10:1 Beef
Patty



### LIFE CYCLE ASSESSMENT Outcomes, interpretation and improvement





**Carbon Footprint**, total amount of greehouse gas (GHG) expressed in tons CO<sub>2</sub>

(Inalca is also involved in a new sperimental project with australian suppliers about new supplements feeding that could deacrese the CO<sub>2</sub> emissions)



Water Footprint, measures water consumption expressed in volume employed or polluted.



**Ecological Footprint**, measures the number of land or maritime plots necessary to regenerate the resources consumed.

The study will assess the economic and environmental performance in terms of:

(eco) efficiency - (economic) efficency

And will set forward the <u>EPD</u>, Environmental Product Declaration and positioning in the market.

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