

Argentina update biogas sector

Jorge Antonio Hilbert



Instituto Nacional de
Tecnología Agropecuaria





PROMOTION OF RENEWABLE ENERGY

✓ **LAW 26.093/2006:** PROMOTES THE PRODUCTION AND USE OF BIOFUELS (Implemented by Decree 109/07).

- ✓ Mandatory use 7% bioethanol and 9% biodiesel
- ✓ Definition of domestic prices for biofuels
- ✓ Quality standards

✓ **LAW 26.190/2006** 8 % Renewables in Electric energy generation

✓ **LAW 27.191/2015** 20% 2020 Under regulation process



The law prioritizes projects that accomplish the following criteria:

- ✓ Sponsored by small and medium sized companies.
- ✓ Belong to farming producers.
- ✓ Located in regional and rural economies.
- ✓ New law imposes renewable targets for the private sector



* Law 26.093 extends benefits to sugar plants, sugarcane and ethanol producers



BIOENERGY FROM RESIDUES IN ARGENTINA

Argentina is a main producer of raw materials and manufactures

Agriculture Sector

Livestock Sector

Forestry Sector

Industries

Waste / by-products increase



Based on WISDOM, power installed capacity could be increased up to 1,325 MW of total electricity capacity and by 1,325 MW of thermal generation by 2030



Program to promote the use of biomass for energy production in Argentina (PROBIOMASA)



Implemented by the Government of Argentina through the Ministries of *Agriculture* and *Energy*, with technical assistance from the *FAO*.

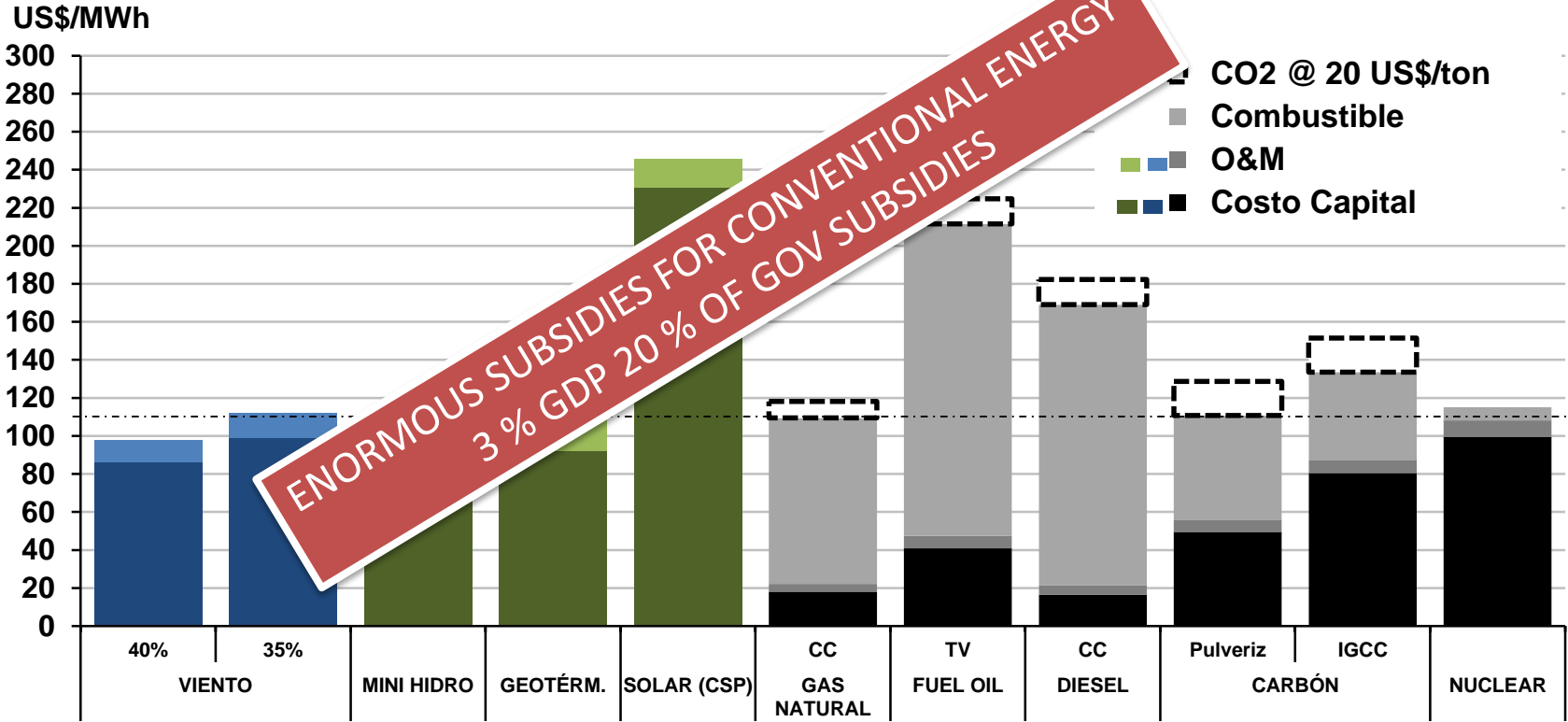
Adding value to waste /
by-products of
agriculture, livestock
and forestry

The *main objective* of this program is to promote the development of bioenergy at the regional and national level, in order to supply clean, reliable and competitive energy.



Cost of competitive MWh

Prices payed by consumers 3 to 10 US\$/MWh



Costo de Capital (US\$/kW) /
Factor de Carga (%):

Viento	2000/40%	Mini Hidro	2200/50%
Solar CSP	4000/30%	Geotérmica	3900/85%
CC (gas)	900	Carbón Pulv.	2000
Nuclear	4000	Carbón IGCC	3000

Costo Combustible.:

Gas Natural @ 12 US\$/MMBTU
Petróleo @ 100 US\$/bbl
Carbón CIF @ 150 US\$/ton

Rentabilidad:

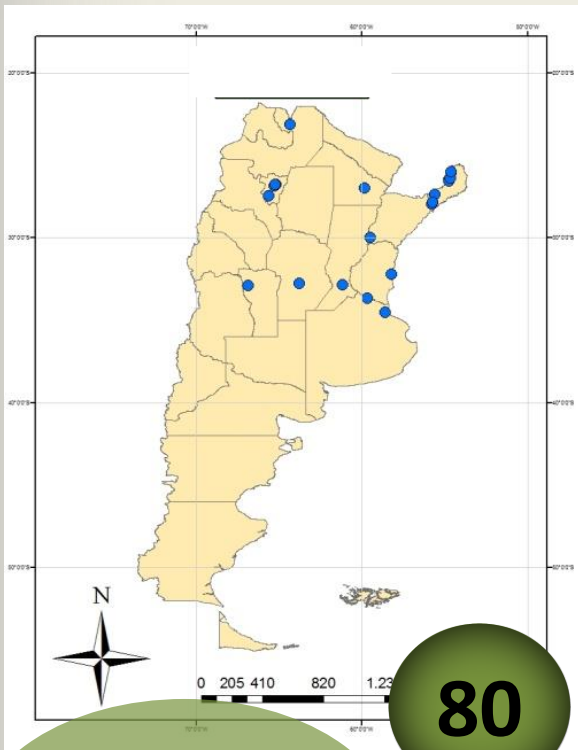
TIR 10% después de IG
sobre activos (i.e. sin leverage)
Sin IVA. Contratos de 20 años.



FIRST SURVEY OF BIOGAS PROJECTS

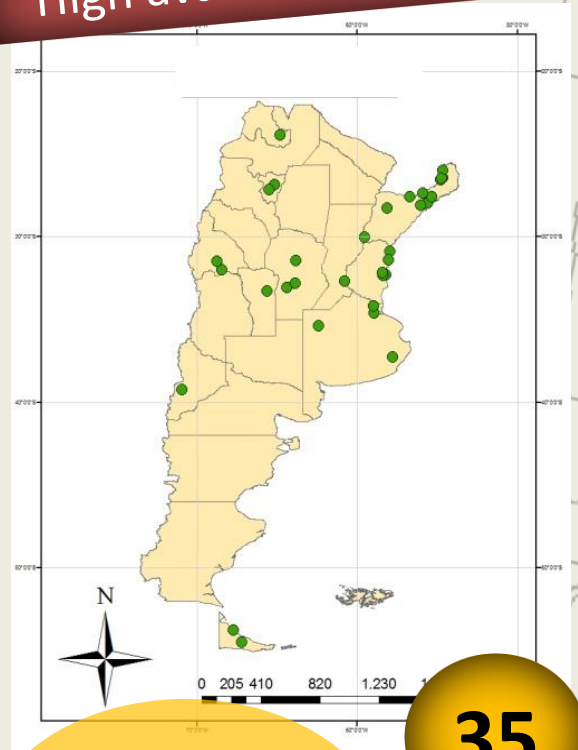
PROBIOMASA
ENERGÍA FIRME Y LIMPIA PARA CRECER

High availability of biomass



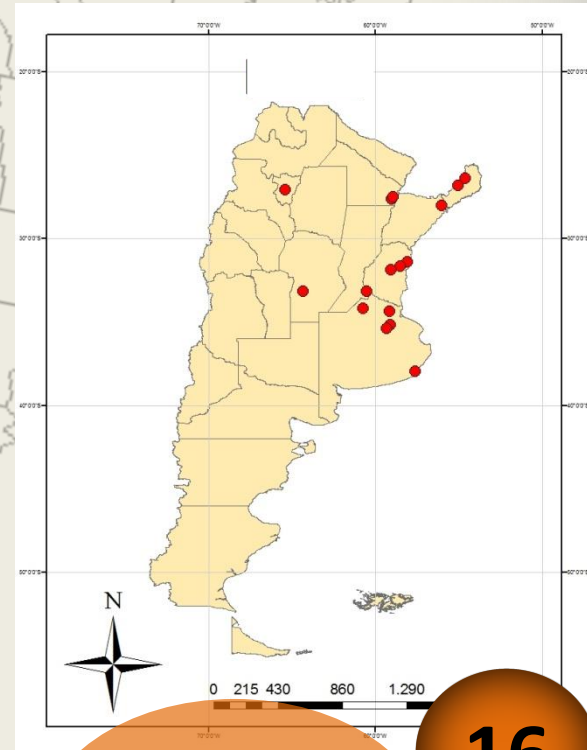
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PROJECTS IN
OPERATION



35

PROJECTS UNDER
CONSTRUCTION



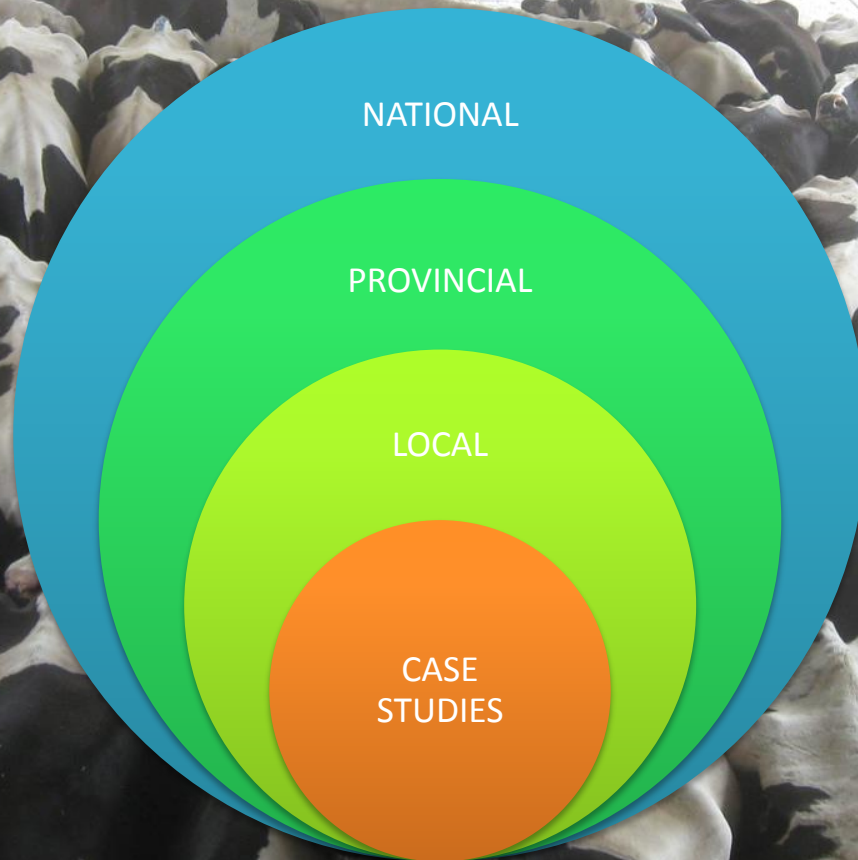
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PROJECTS
UNDER
EVALUATION

FIRST SURVEY OF BIOGAS PROJECTS

Empresa	Provincia	Localidad	Etapas del proyecto	Sector	Actividad	Capacidad instalada	Origen de la biomasa
Biogás Argentina	Buenos Aires	Carlos Tejedor	Construcción	Energía termica o eléctrica	Biodigestion de efluentes	0,4 MW	Feedlot
Bio4/Bioeléctrica	Córdoba	Rio Cuarto	Construcción	Energía eléctrica	Producción de biogás	1 MW	Cereales & Oleaginosas
Alimentos Magros S.A. (ACA)	San Luis	Juan Llerena	Construcción	Cogeneración	Producción de biogás	1,5 MW	Industria porcina
Gral. Pirán Biogás guano aviar	Buenos Aires	General Pirán	Cartera	Biogás- energía eléctrica	cama de pollos	0,6 MW	Industria avícola
Proyecto RSU Cooperativa Rocío (Gral. Rodríguez)	Buenos Aires	General Rodriguez	Cartera	Biogás- energía eléctrica	RSU - biomasa	11 MW?	RSU
Adecoagro Tambos La Lacteo	Córdoba	Capilla de los Remedios	Cartera	Biogás- energía eléctrica	tambo bovino	1-3 MW	Tambo
Avícola Las Camelias S.A.	Entre Ríos	San José	Cartera	Energía Eléctrica	Motor con biogás	0,6 MW	Industria avícola
Don Guillermo S.R.L	Misiones	El dorado	Cartera	Biogás- energía eléctrica	Producción de biogás	100 kw	Feedlot, Cerdos
Solamb SRL	Santa Fe	Timbúes	Cartera	Energía eléctrica	Motor con biogás	1 MW	Efluentes biodiesel
Cooperativa Agrícola e Industrial San Alberto (Puerto Rico)	Misiones	Puerto Rico	Cartera	Energía térmica	Producción de biogás	10000 m3/día biogás	
Paladini	Santa Fe	Arroyo Seco	Cartera	Energia termica	Biodigestión de efluentes		

RESOURCES FOR BIOGAS PRODUCTION DEPTH OF STUDIES

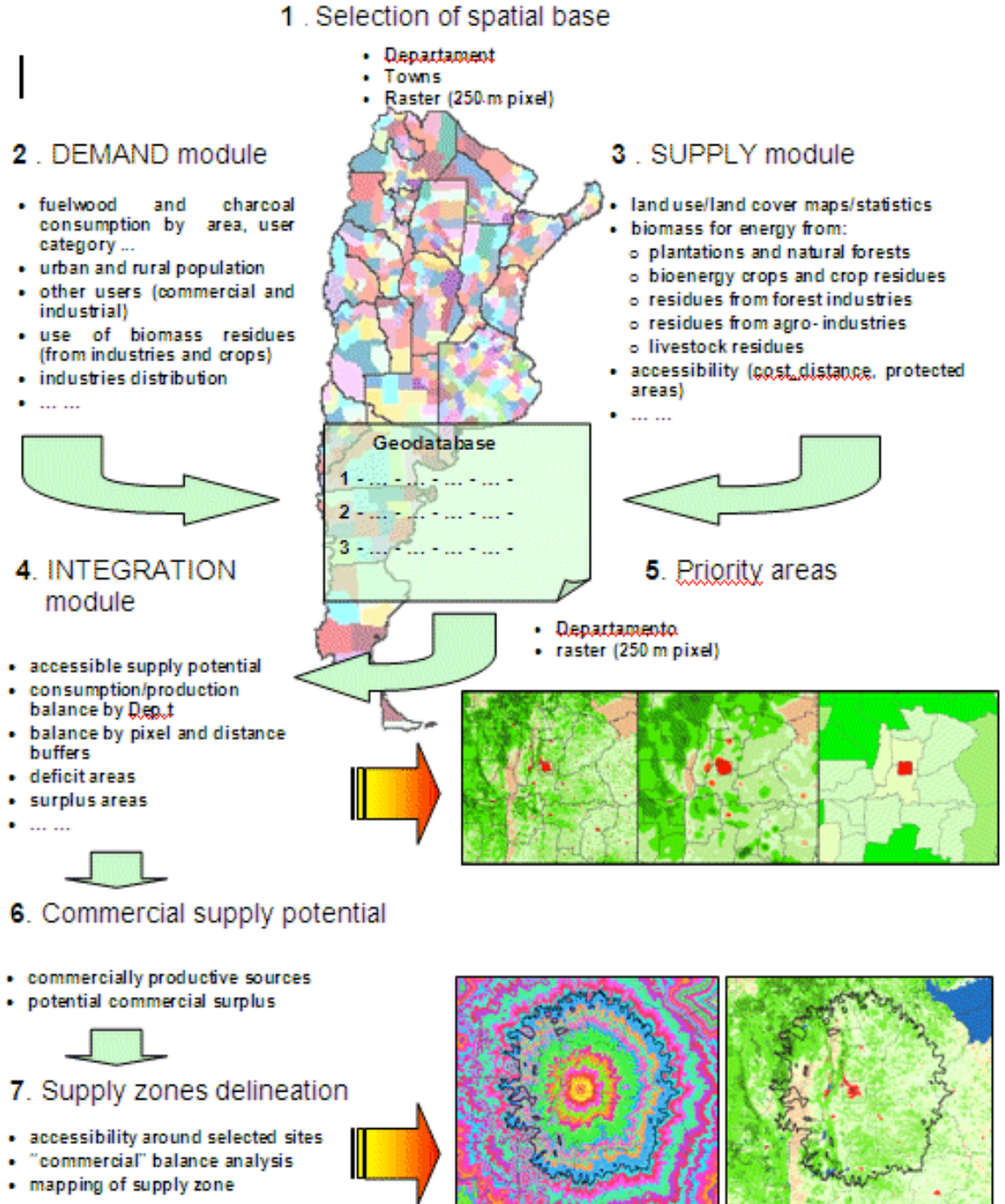


BIOMASS SOURCES STUDIED BY INTA

AGROINDUSTRY	biogas from wine industry
	biogas from vinace from sugarcane bioethanol
	biogas from fruit juices
	biogas from dairy industry
	biogas from fruit and vegetable processing
	biogas from beer industry
	biogas from bread and other flour industries
SLAUGHTERHOUSES	biogas from slaughterhouses and meat processing
FISHERIES	biogas from fish transforming chain
ANIMAL RESIDUES	biogas from feedlots and dairies
	biogas from confines swine production
	biogas from chicken and egg production
CROP RESIDUES	...

Implementation of an Geographic Information System on Biomass Resources

WISDOM-FAO
Methodology
Woodfuel Integrated
Supply/Demand Overview
Mapping

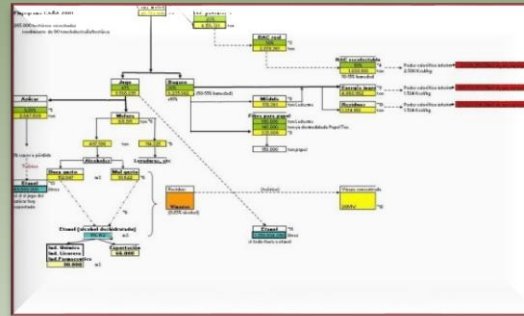


METHODOLOGY

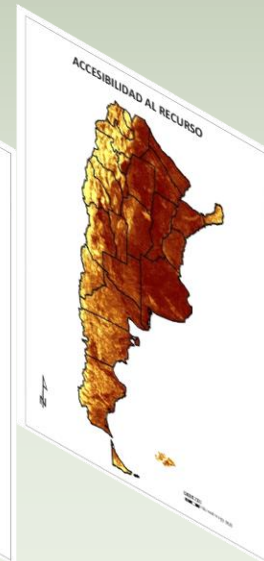
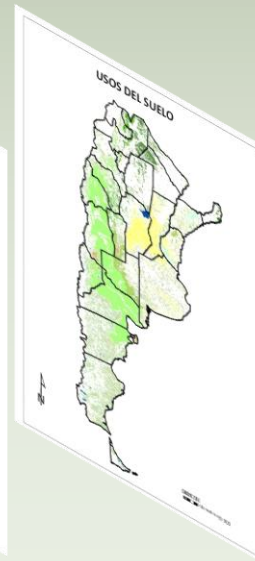
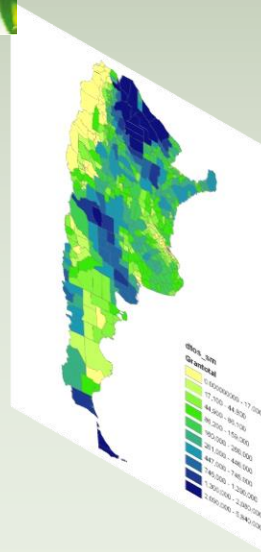
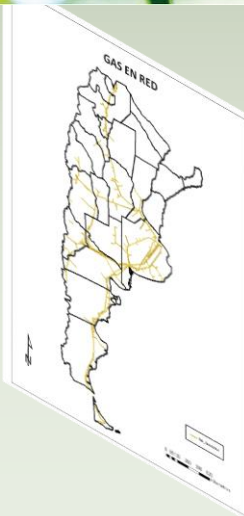
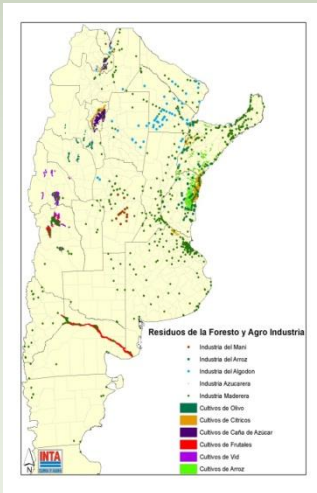
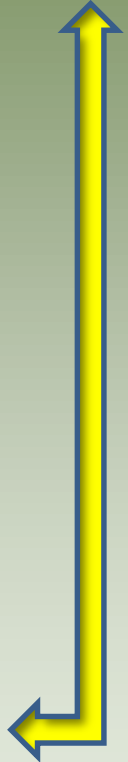
IDENTIFICATION OF RAW MATERIALS THAT COULD BE USED



STUDY OF WASTE-GENERATING AGRICULTURAL CHAINS

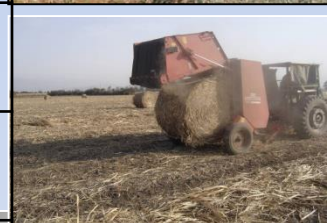


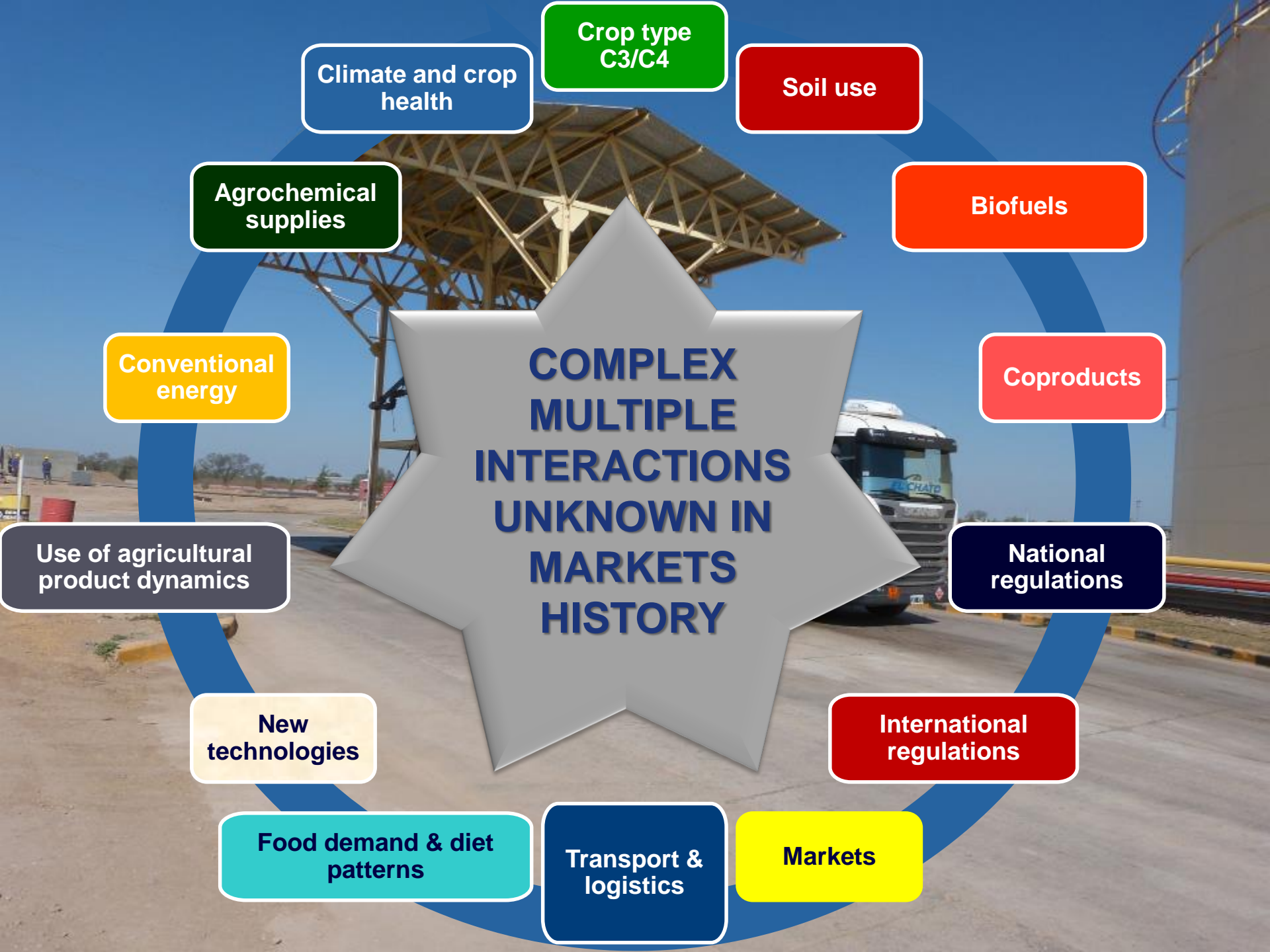
LOCALIZATION OF THE INFORMATION IN THE GEOGRAPHICAL SPACE



Argentinean Crop Residue Supply

	E	F	M	A	M	J	J	A	S	O	N	D
Vineyard pruning							X	X	X	X		
Grape pomace					X	X	X	X				
Olive pruning							X	X	X			
Olive Pomace				X	X	X	X	X	X			
Sugaarcane--RAC					X	X	X	X	X	X	X	
Sugarcane-Bagaze						X	X	X	X	X	X	X
Wheat	X										X	X
Maize				X	X	X	X					





**Crop type
C3/C4**

**Climate and crop
health**

Soil use

Biofuels

**Agrochemical
supplies**

Coproducts

**Conventional
energy**

**COMPLEX
MULTIPLE
INTERACTIONS
UNKNOWN IN
MARKETS
HISTORY**

**National
regulations**

**Use of agricultural
product dynamics**

**International
regulations**

**New
technologies**

Markets

**Transport &
logistics**

**Food demand & diet
patterns**

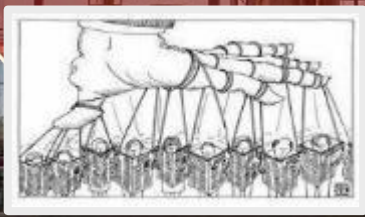
Sustainability public perception & awareness installation in society and its consequences



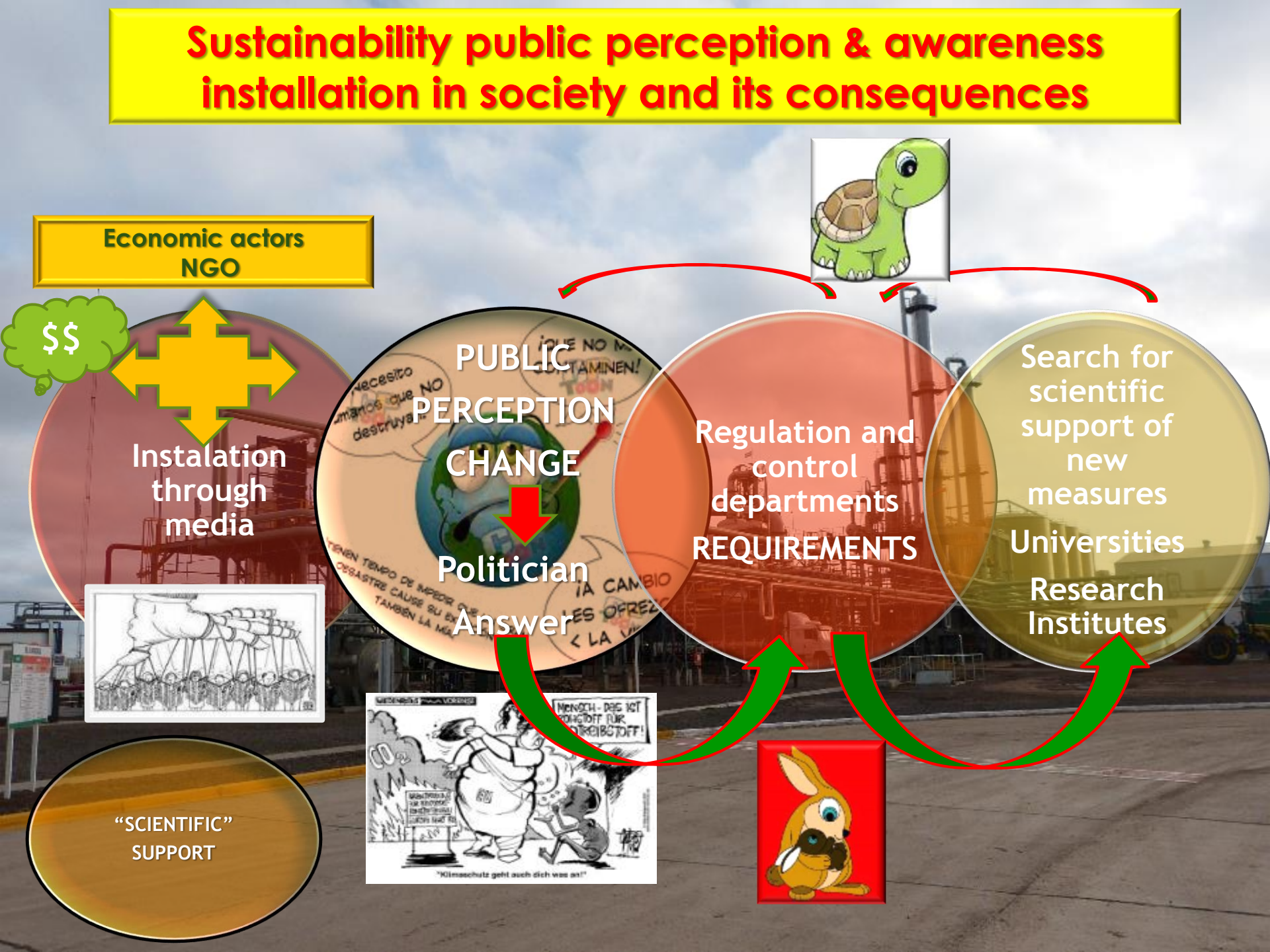
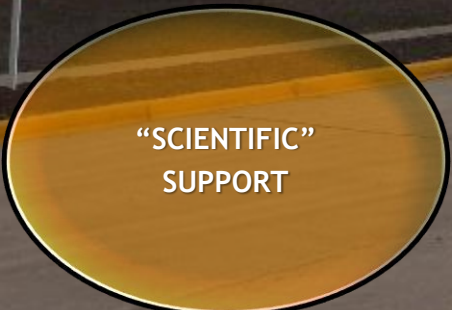
Economic actors
NGO



Installation
through
media



Regulation and
control
departments
REQUIREMENTS





Case study projects

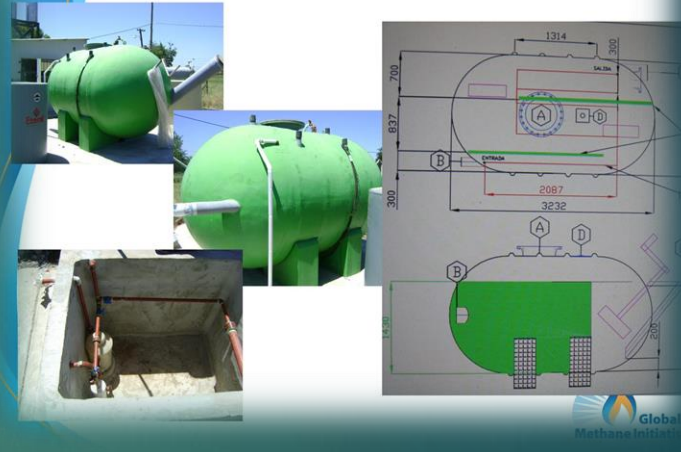


Research at experimental stations

Research digester I
Food waste



High efficient dairy farm digester II

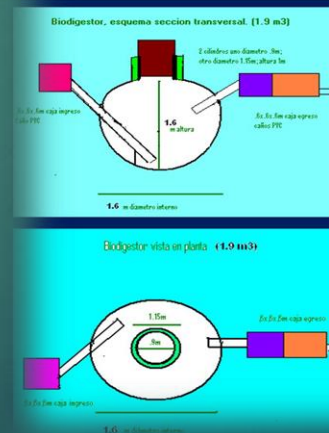


Pilot plant INTA Rafaela Experimental Station Dairy
Santa Fe

- Digester development:
Dairy farm loaded, problems with crust and lack of mixing device.



LOCAL MODELS EXP STATION RECONQUISTA



OUT OF SERVICE DUE TO MIXING PROBLEMS AND BAG FAILURE

New high technology projects

YANQUETRUZ 1300 Mothers



SUBSTRATES

- ✓ Pig manure: 150 m³/day
- ✓ Corn/sorghum silage: 50 ton/day

BIOGÁS PRODUCTION

12.887 m³/day
8.000 Mw/year

PLANTA CONFIGURATION

- ✓ two Primary Biodigesters 3619 m³ c/u
- ✓ Two secondary Biodigesters 2897 m³ c/u
- ✓ Two CATERPILLAR engines 756 kw
- ✓ Electric power= 1,53 Mw
- ✓ Heating system
- ✓ Emergency Torch 800 m³ / h
- ✓ Blowers 400 mbar y 390 m³/h

**Residue management and
electricity generation**

TECNORED CONSULTORES S.A.
www.tecnoredconsultores.com.ar
Río Cuarto - Córdoba

BIOELECTRICA FINISHED FIRST DIGESTER WITH PLANS TO CONSTRUCT 60 PLANT OF 1 Mw

Investors 29 farmers



info@bioelectrica.com



www.bioelectrica.com





FIRST FEEDLOT IN THE PROVINCE OF BUENOS AIRES



- Hernando Cordoba pig Farm
Biodigestor 2400 m³
TRH 15 days
Production 30 a 50m³ hora
Microturbines Capstone de 30 KwH buyer Empresa
Provincial de Energía Eléctrica de Córdoba (EPEC)





BIO METANOS DEL SUR S.A.

Proyectos de Producción Agropecuaria y Desarrollo Sustentable



250 m³
volumen

250 m³
volumen

1750 m³
volumen



Biogas production from agroindustry residues



INTA ODEBRECHT 2011
Slaughter house in Salta
30 cubic meters
6 meter altitude



New Anaerobic digester CALSA ADI BVF Tucuman 2010/11



420000 CO2 reduction/year



High efficiency UASB plant corn plant Chaabuco and Baradero Dedini Technology Brazil



Digester volume 1200 cubic meters
Biogas production 6000 a 7500 m³/day
Methane concentration 72 %



General view of the plant operated by biotec CITRUSVIL 2010/11

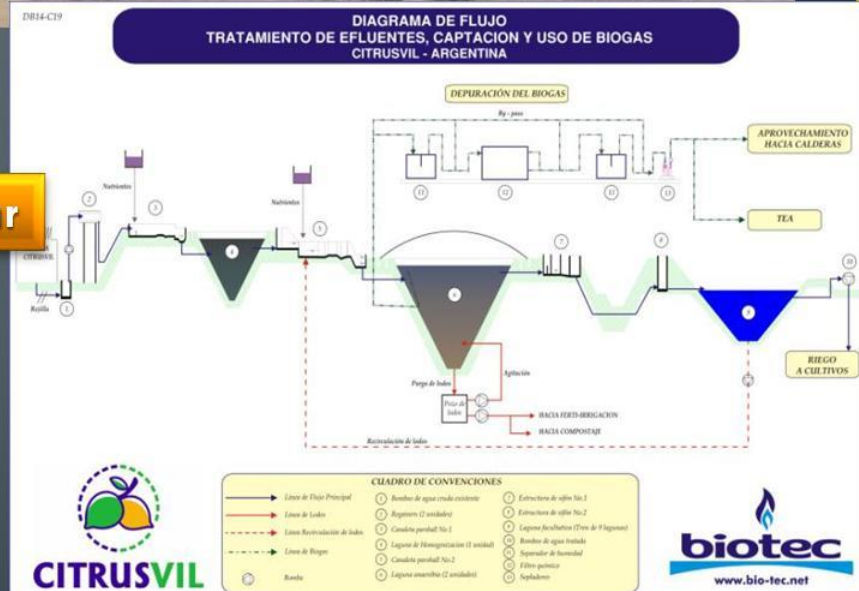


80.000 m² - 2700 m³/hora



Parshalls de ingreso a biodigestores

51.0000 CO₂ reduction/year



**Las Camelias Chicken slaughter house Entre Rios
2011**

**1500 cub meter of biogas per day
8700 Tons/year reduction CDM**



New Plants 2015



Feedlot biogás plant in Buenos Aires province

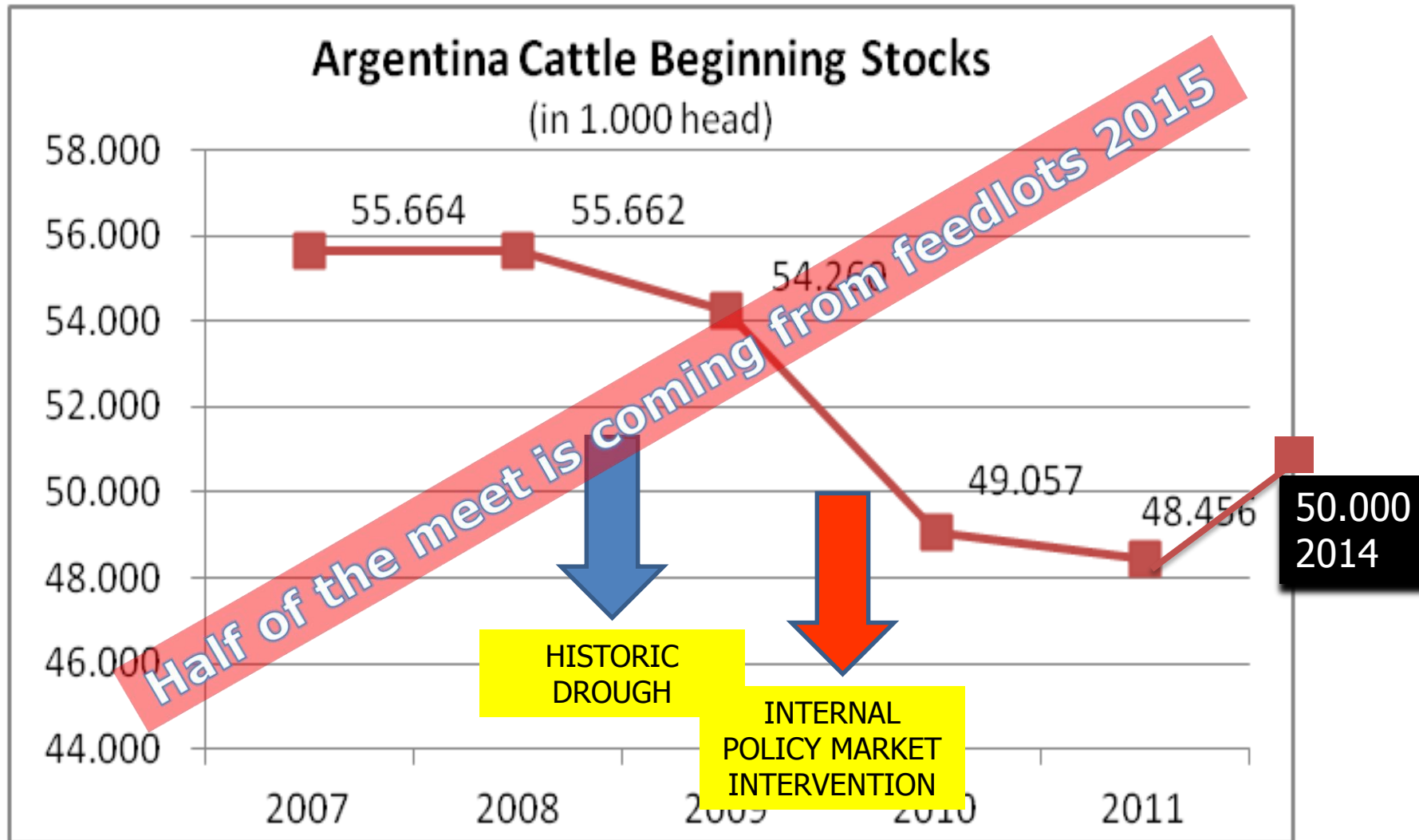


Wet residue plant in San Luis



Urban + agroindustrial residues Santa Fe

ENTERIC CONTRIBUTION HERD POPULATION IMPACT ON METHANE EMISSIONS AND LUC & iLUC

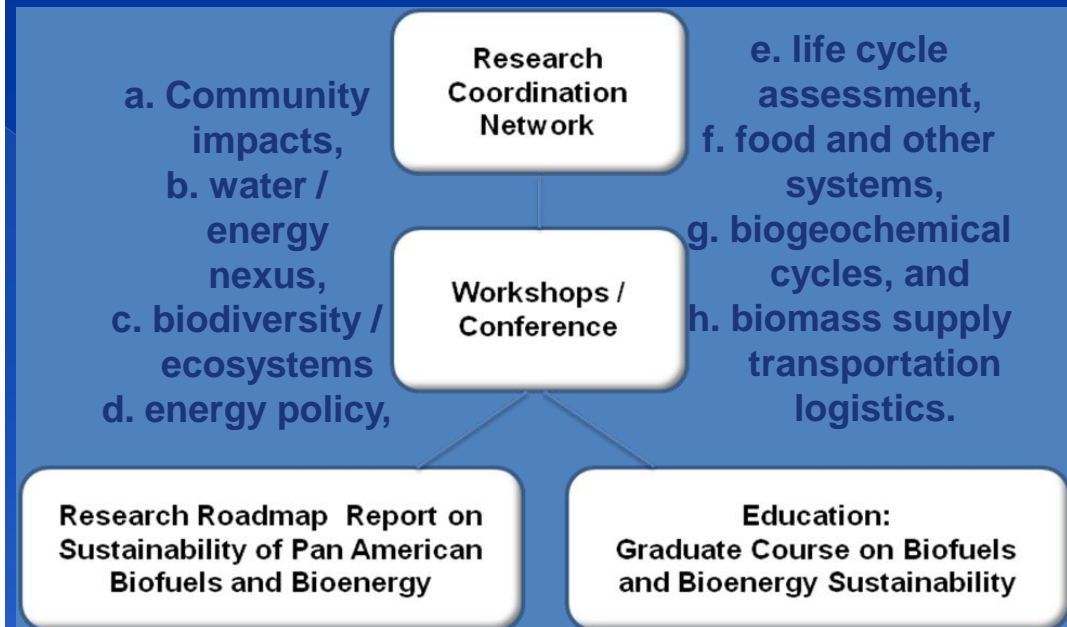


2nd RCN Conference on Pan American Biofuels & Bioenergy Sustainability

Buenos Aires, Argentina
September 13-16, 2016



**PAN-AMERICAN
BIOFUELS &
BIOENERGY
SUSTAINABILITY**
AN NSF RESEARCH COORDINATION NETWORK



- a. Community impacts,
- b. water / energy nexus,
- c. biodiversity / ecosystems
- d. energy policy,

- e. life cycle assessment,
- f. food and other systems,
- g. biogeochemical cycles, and
- h. biomass supply transportation logistics.

Research Roadmap Report on Sustainability of Pan American Biofuels and Bioenergy

Education: Graduate Course on Biofuels and Bioenergy Sustainability

<http://www.aiche.org/panamrcn/events/rcn-conference-on-pan-american-biofuels-and-bioenergy-sustainability>

Bioenergía

Ver todos los contenidos sobre este tema



Cuantificación y uso de biomasa de residuos de cultivos en Argentina para bioenergía

Análisis de la factibilidad del uso de residuos de cosecha de maíz y/o sorgo (rastros) como potenciales fuentes de materia prima para la generación de biocombustibles.

Publicaciones



El uso de la biomasa de Origen Forestal con destino a bioenergía en la Argentina



Biocombustibles: El avance de la certificación de sustentabilidad en la Argentina



Actualización del cálculo de la reducción de emisiones producidas por el corte obligatorio

Agenda Bioenergía

- 7 nov 2013 Rol del bioetanol en la matriz energética
- 11 nov 2013 1ª Jornada Internacional de Biomasa
- 13 nov 2013 III Congreso Internacional de Ambiente y Energías Renovables

Ver todos

Noticias sobre Bioenergía

- Bioenergía
- Residuos con energía
- Biomasa forestal con fines bioenergéticos

Ver todas



Continuar viendo todo lo que asó en INTA expone

Biodiesel

La estrategia del INTA en el desarrollo de la Producción de Biocombustible como valor agregado

Cadena de valor de la Colza en Mendoza

Proyectos Institucionales del Programa Nacional de Bioenergía

Actualización del cálculo de la reducción de emisiones producidas por el corte obligatorio

Ver todos

Biogas

Manual para la producción de biogas

Relevamiento unificado INTA (INTI) 2010 para la producción de biogas

Estudio de caso preliminar de generación eléctrica de 1 MWel con una planta de biogas de alta eficiencia

Taller Nacional del Programa AGSTAR de biogás organizado por la Agencia de Medio ambiente EPA de los Estados Unidos.

Ver todos

Bioetanol

Generación de Energía con cultivos y residuos forestales

Prácticas de manejo en sorgos azucarados para la obtención de etanol en Argentina

Productividad de sorgos azucarados para la obtención de etanol en diferentes ambientes de Argentina

Ver todos

Tweets

Seguir

Bioenergía INTA @ArgentinaPNEBio

2 nov

Aumentar el corte del gasol y abrir nuevos mercados, las alternativas ante el arancel europeo al biodiesel

Bioenergía INTA @ArgentinaPNEBio

2 nov

4 Jornada biocombustibles

Thank you for your attention

- ◉ Ing.Agr. M.Sc. Jorge A. Hilbert
 - > INTA y UTN
 - > Tel +54 11 4665-0495 0450
 - > Mail hilbert@cnia.inta.gov.ar
 - > <http://inta.gob.ar/bioenergia>

