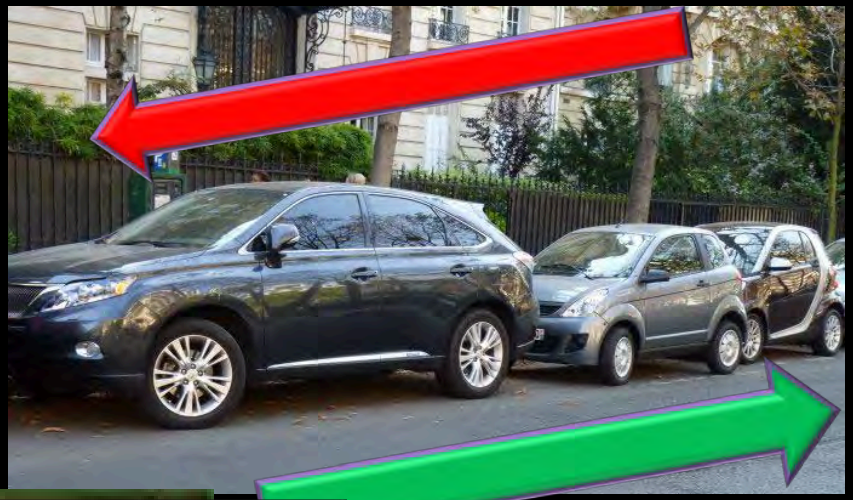
Global Methane Initiative (GMI) Tri-Subcommittee Meeting, Florianópolis Brazil

Investments and new projects in agriculture biogas in Argentina

Instituto Nacional de
Tecnología Agropecuaria

INTA

WERE ARE WE HEADING AS MODERN SOCIETIES REGARDING ENERGY AND FOOD USE



1.300 millones tons food waste 800 milion obesity

Sustainability awareness installation in society and its consequences

Economic actors
NGO

Media treatment

CHANGE IN PUBLIC PERCEPTION

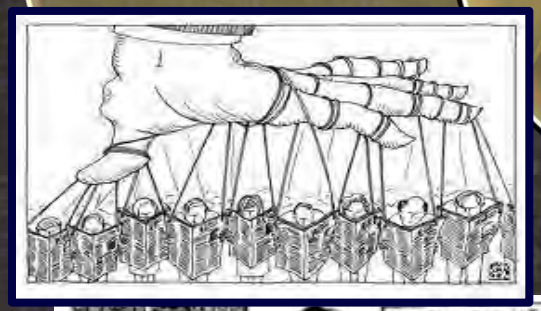
Political answer

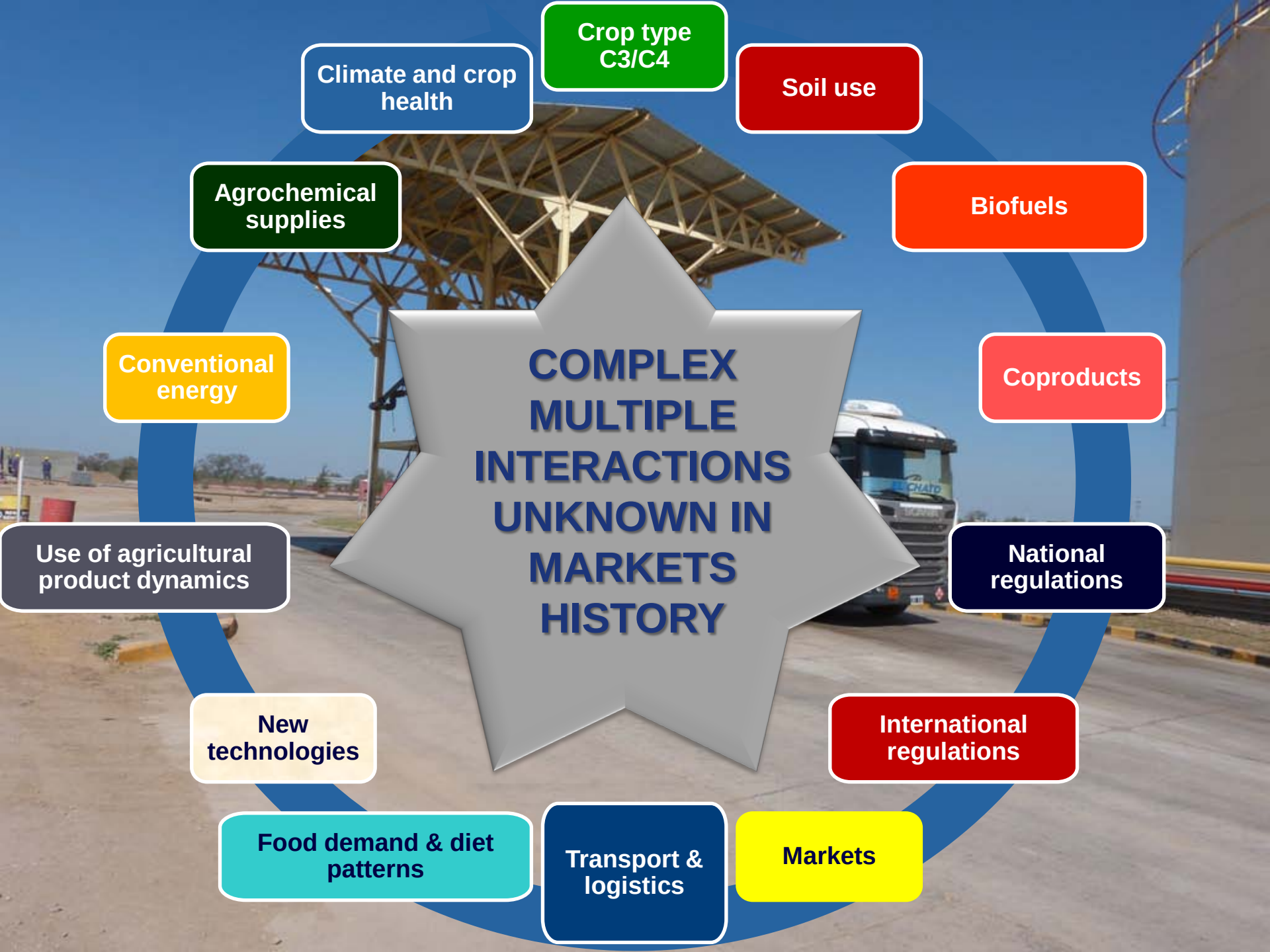
Regulation and control departments

Search for scientific support of new measures

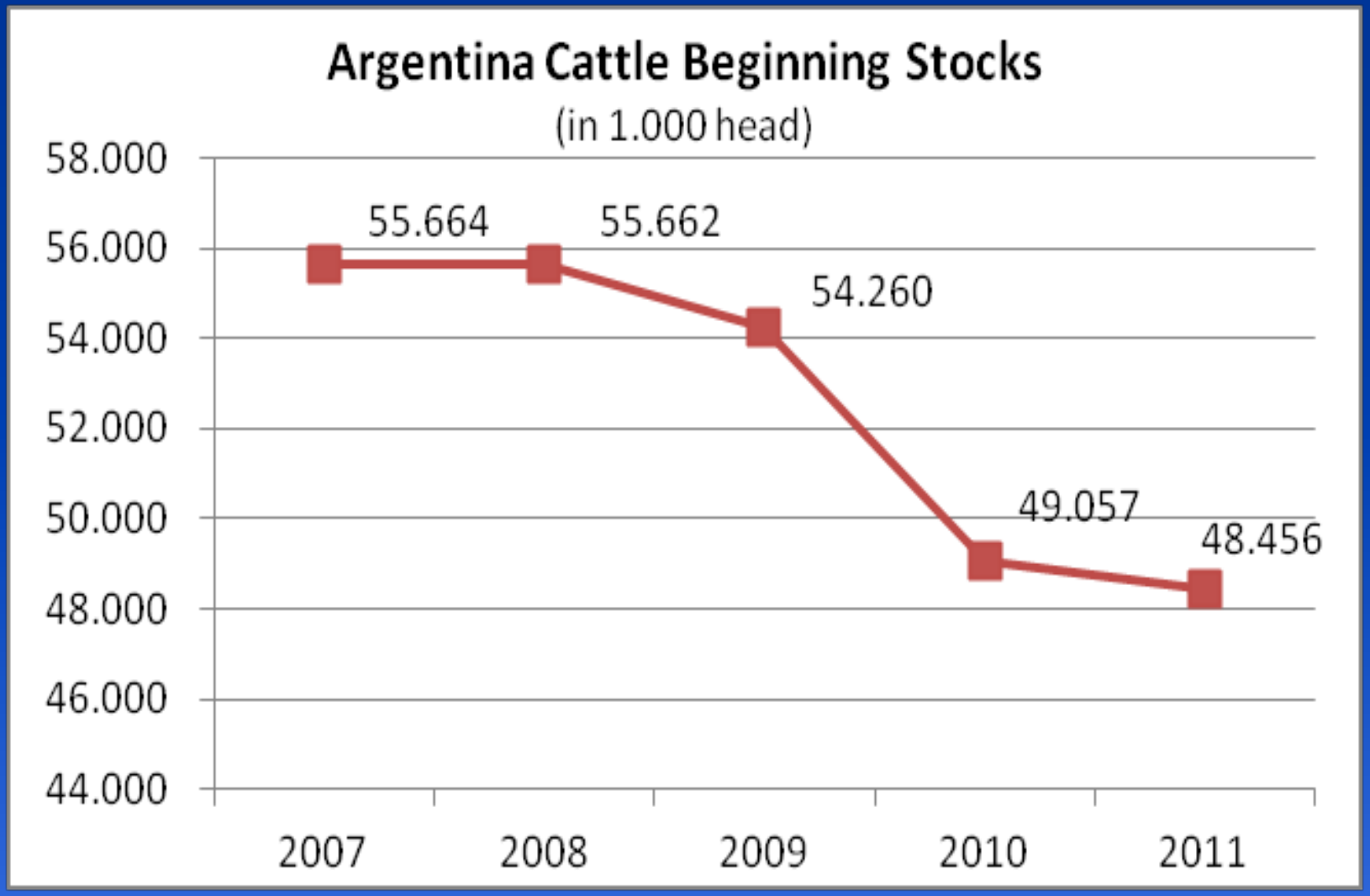
Universities

Research Institutes



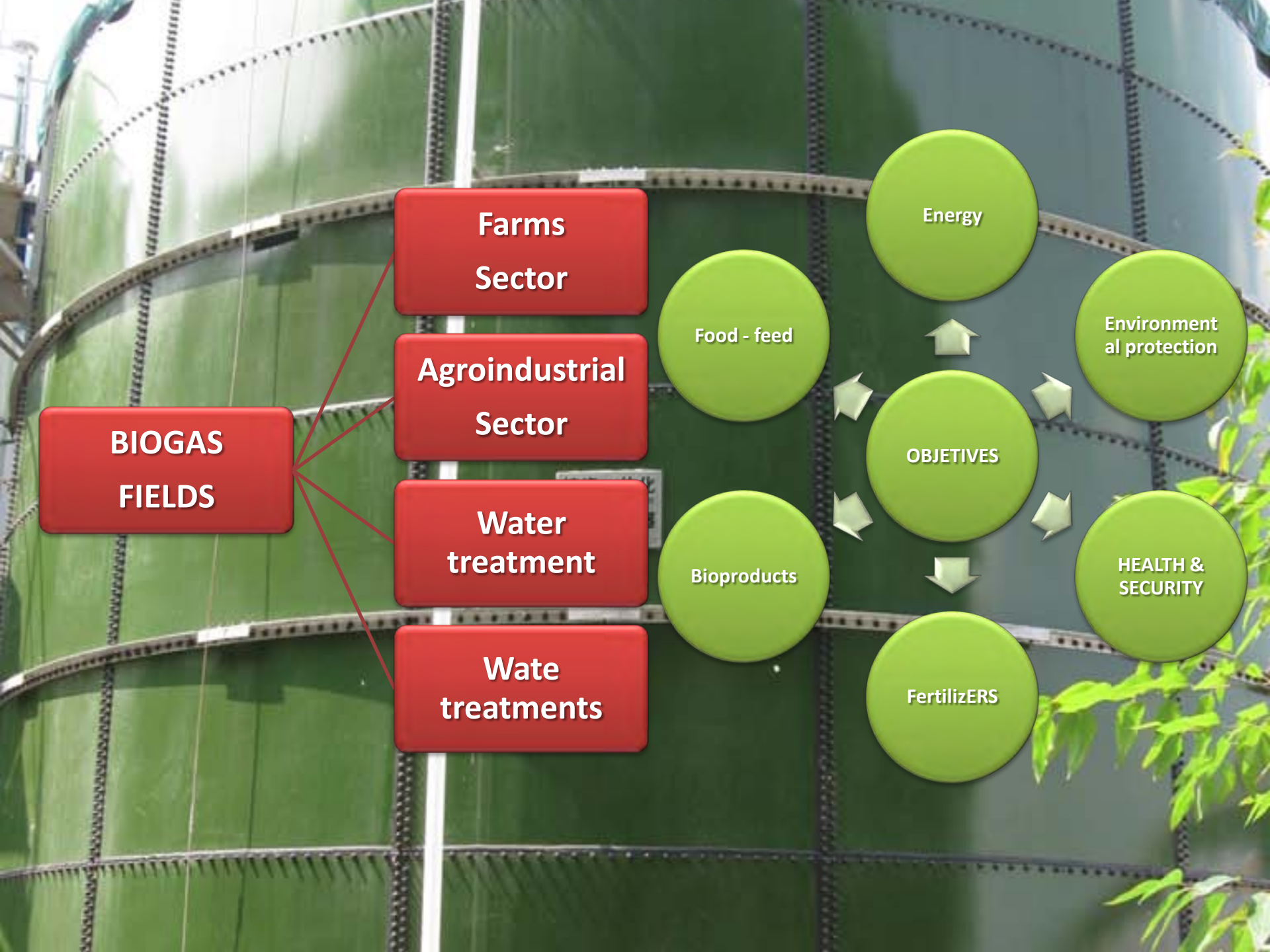

Crop type C3/C4
Soil use
Biofuels
Coproducts
National regulations
International regulations
Markets
Transport & logistics
Food demand & diet patterns
New technologies
Use of agricultural product dynamics
Conventional energy
Agrochemical supplies
Climate and crop health
COMPLEX MULTIPLE INTERACTIONS UNKNOWN IN MARKETS HISTORY

EXTERNAL FORCES HAVE AN IMPORTANT IMPACT IN ACTIVITIES MUCH RELATED TO METHANE GENERATION

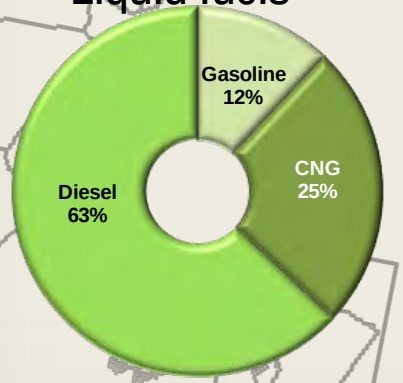


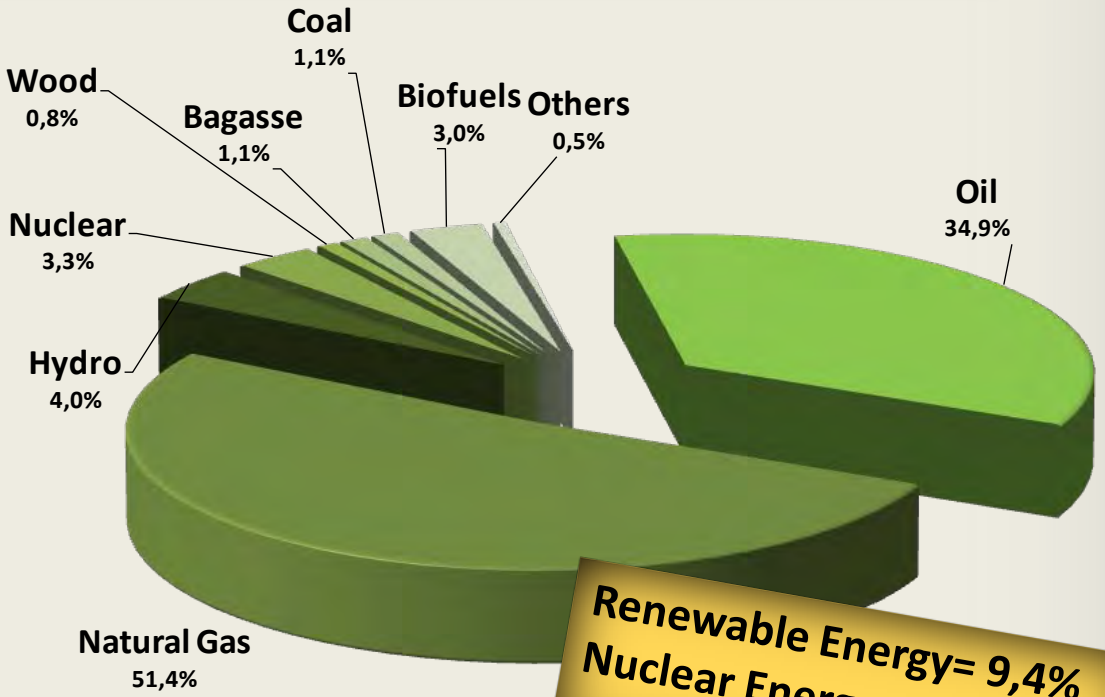
New challenges for the agricultural residue use

- Carbon balance
- Wind and water erosion control
- Water cycle
- Nutrients cycle and reposition
- Edaphoclimatic factors interactions
- Models for each agro ecological region


BIOGAS FIELDS
Farms Sector
Agroindustrial Sector
Water treatment
Wate treatments
Food - feed
Bioproducts
Energy
Environmental protection
HEALTH & SECURITY
FertilizERS
OBJETIVES

ARGENTINE ENERGY CONSUMPTION BY SOURCE





Renewable Energy= 9,4%
Nuclear Energy= 3,3%
Fosil Energy = 87,3%

Argentina imported 14.000 million dolars during 2013

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

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.

* 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

ARGENTINA
UN PAIS CON BUENA GENTE

Ministerio de Agricultura, Ganadería y Pesca
Presidencia de la Nación

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

PROBIOMASA
ENERGÍA FIRME Y LIMPIA PARA CRECER

Implemented by the Government of Argentina through the Ministries of *Agriculture* and *Energy*, with technical [illegible] 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.

PROBIOMASA
ENERGÍA FIRME Y LIMPIA PARA CRECER

SEPECIFIC OBJECTIVES

- Diversify the sources of energy

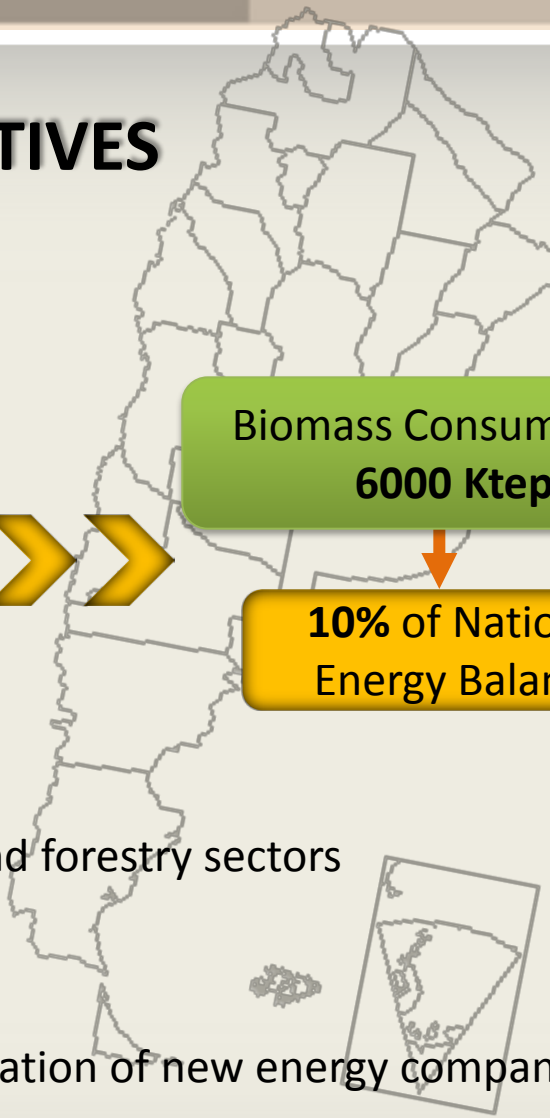
Biomass Consumption: **2000 Ktep**

3% of National Energy Balance

3 years

Biomass Consumption: **6000 Ktep**

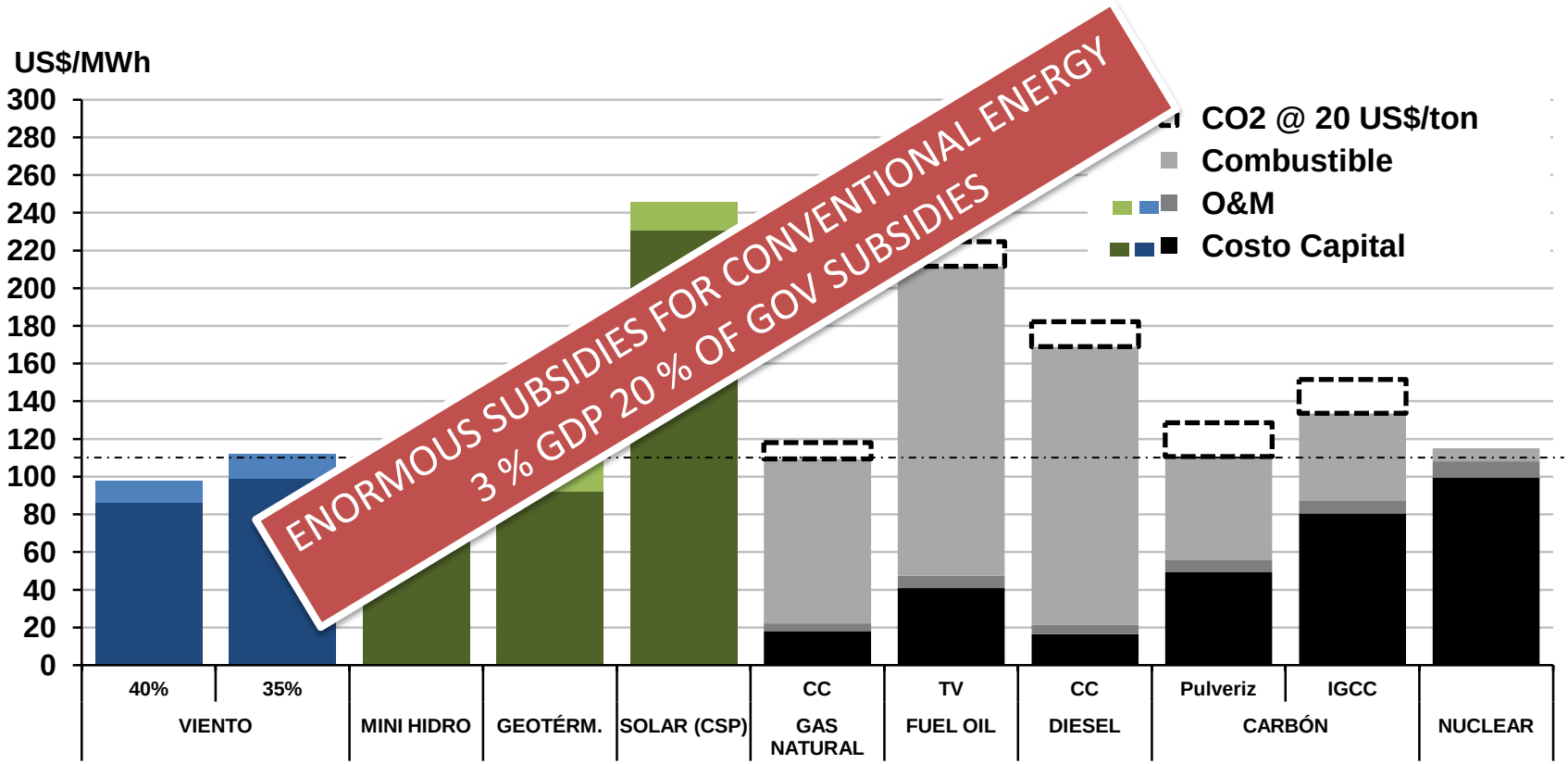
10% of National Energy Balance



- To create new opportunities for the agricultural and forestry sectors
- To add value and boost regional economies
- To promote regional development through the creation of new energy companies
- To contribute to and support climate change mitigation

Cos 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 .*

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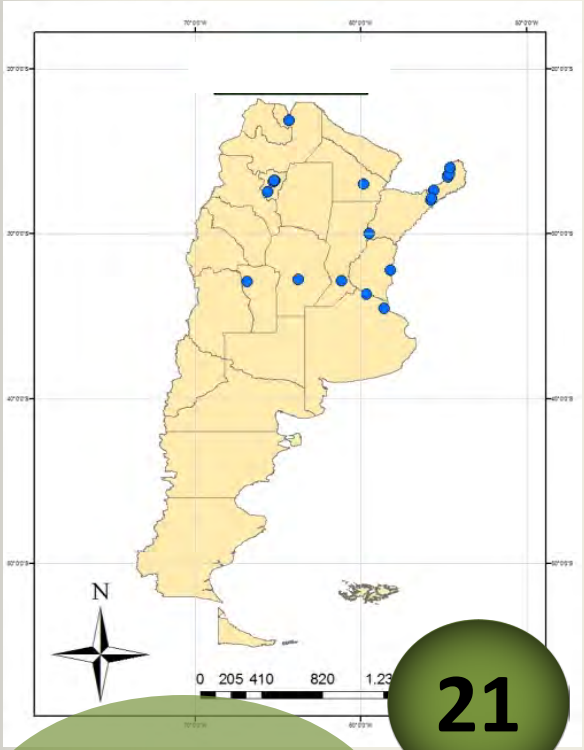
PROBIOMASA
ENERGÍA FIRME Y LIMPIA PARA CRECER

FIRST SURVEY OF BIOMASS PROJECTS

High availability of biomass



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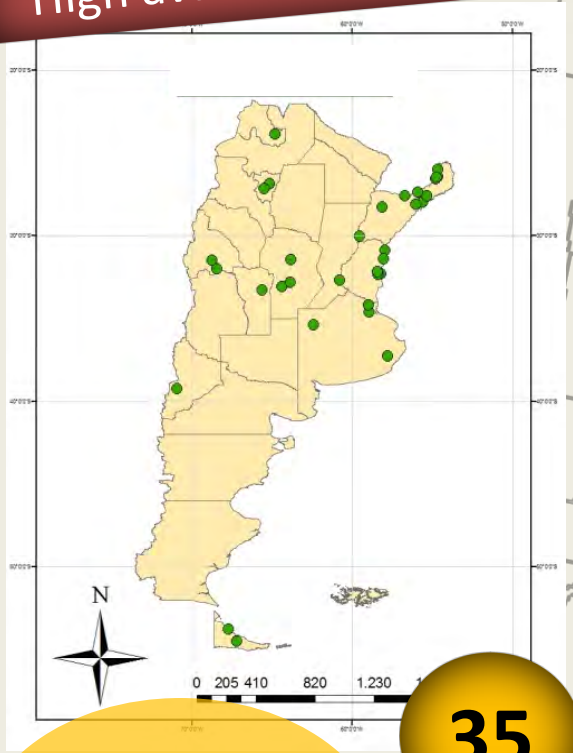
PROJECTS IN OPERATION



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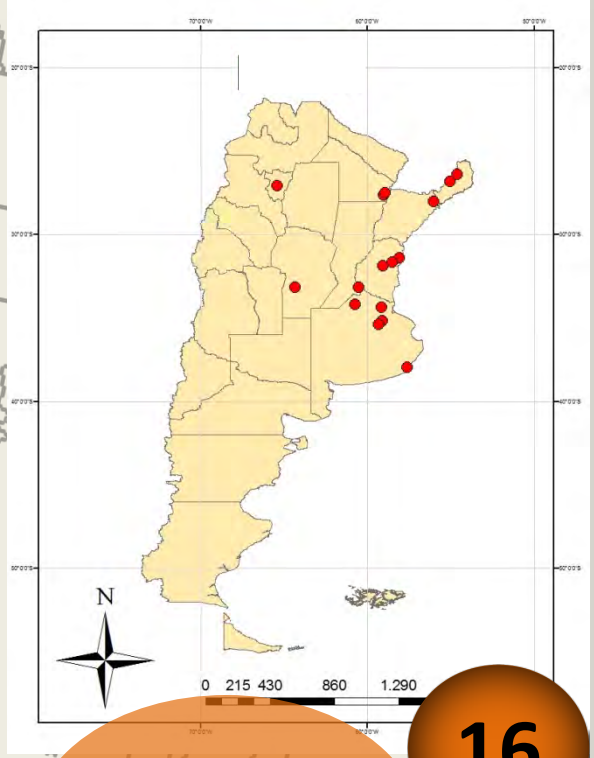
PROJECTS UNDER CONSTRUCTION



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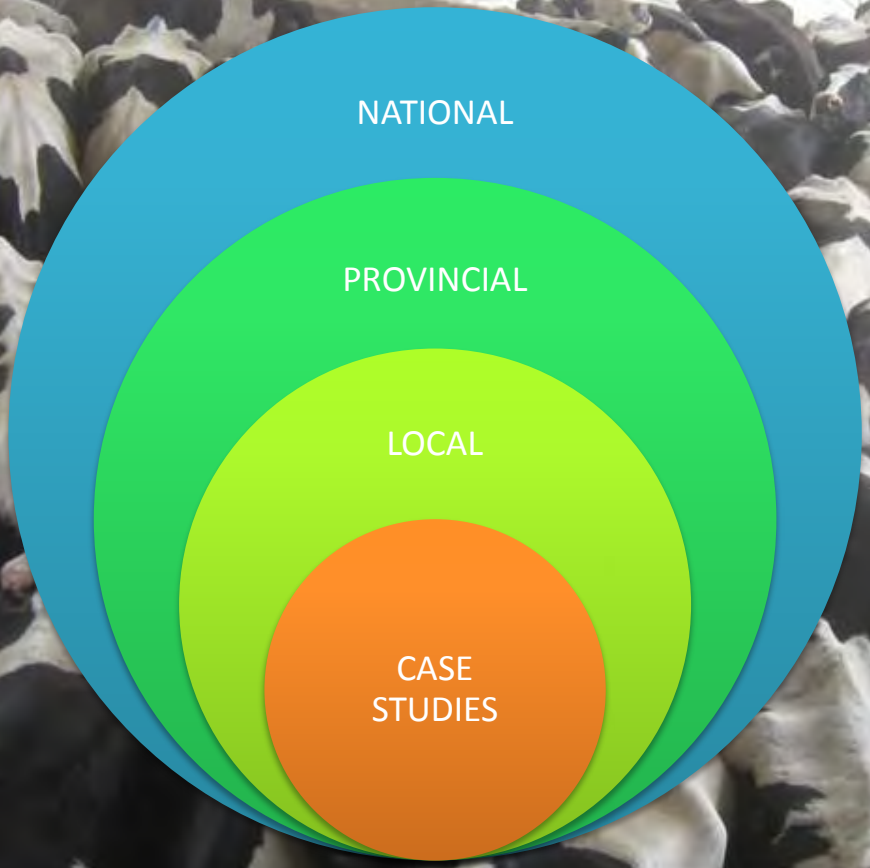
PROJECTS UNDER EVALUATION

FIRST SURVEY OF BIOGAS PROJECTS

Empresa	Provincia	Localidad	Etapa 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 Agricola 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		

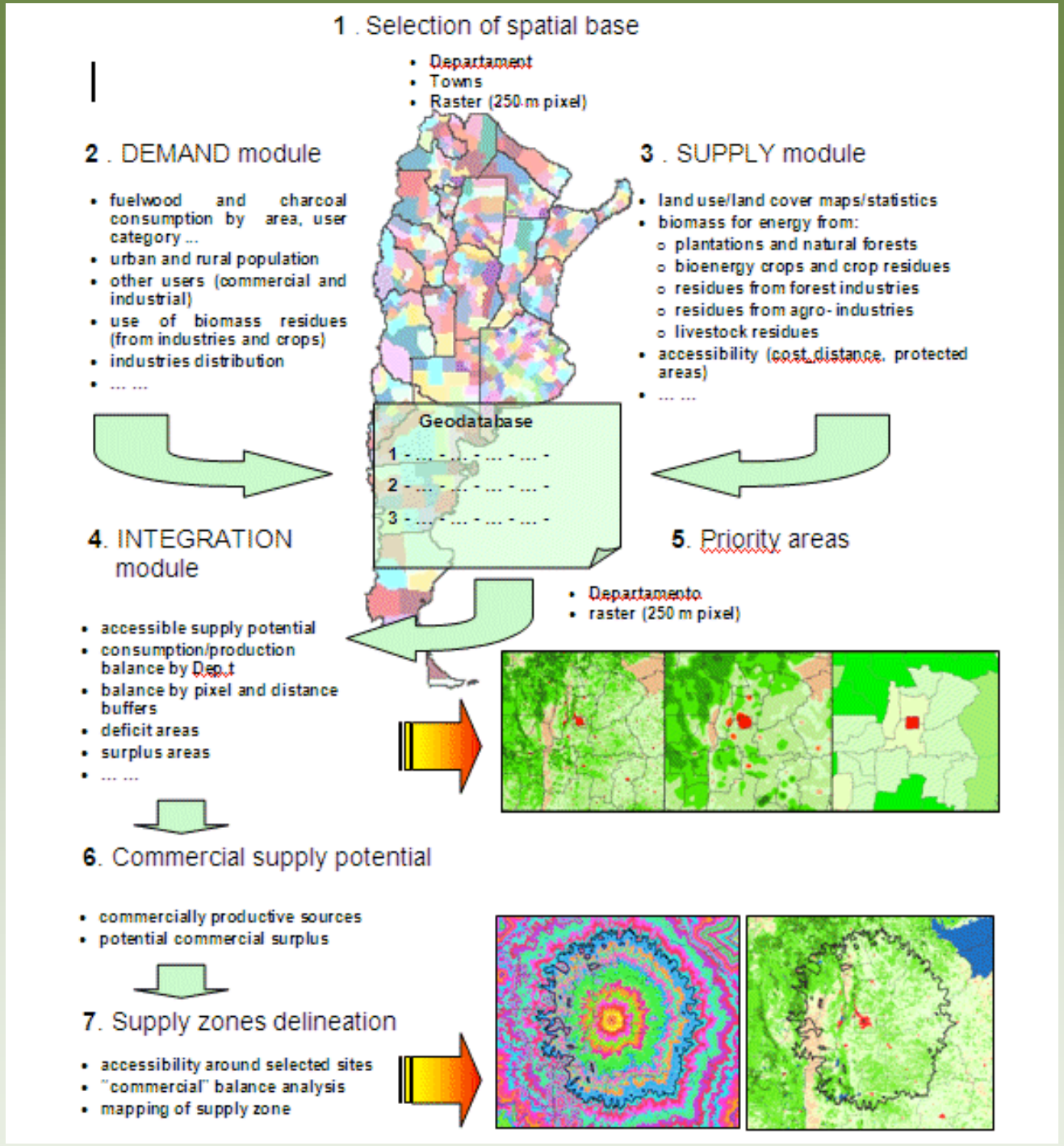
RESOURCES FOR BIOGAS PRODUCTION
DEPTH OF STUDIES



BIOMASS SOURCES STUDIED BY INTA	
AGROINDUSTRY	biogas from whine 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

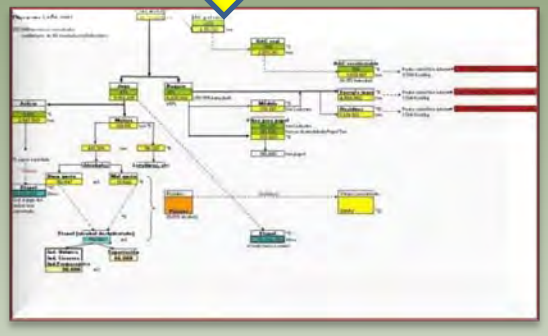
WISDOM-FAO Methodology
(Woodfuel Integrated Supply/Demand Overview Mapping)



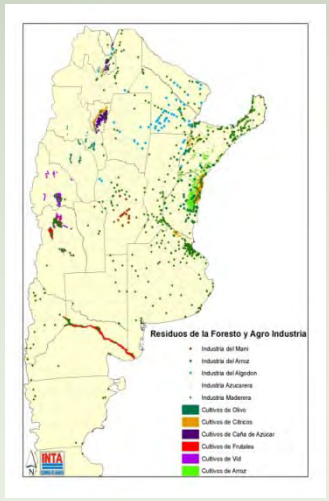
METHODOLOGY

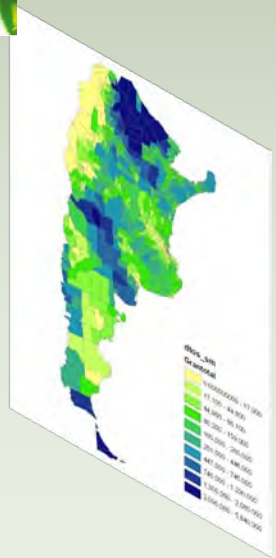
IDENTIFICATION OF RAW MATERIALS THAT COULD BE USED

STUDY OF WASTE-GENERATING AGRICULTURAL CHAINS



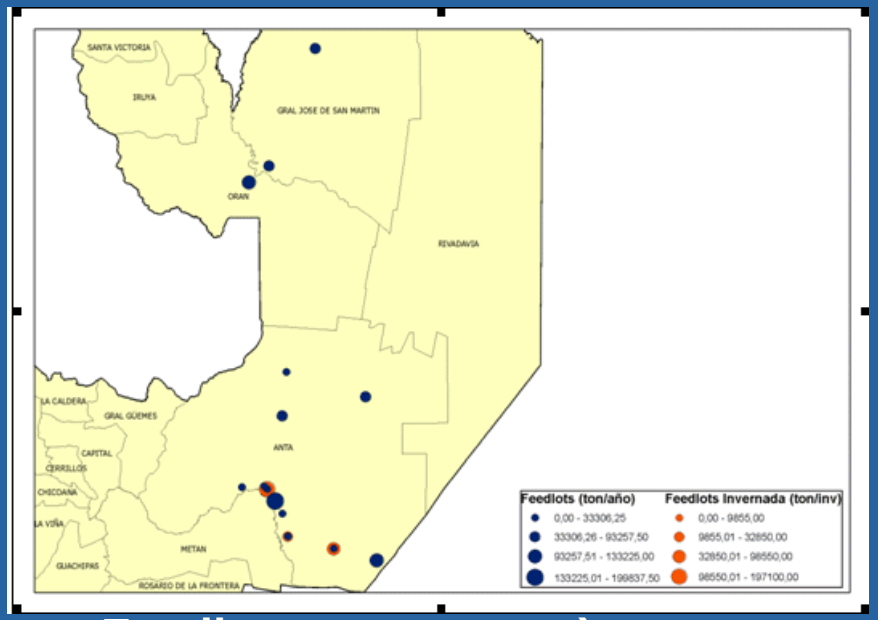
LOCALIZATION OF THE INFORMATION IN THE GEOGRAPHICAL SPACE



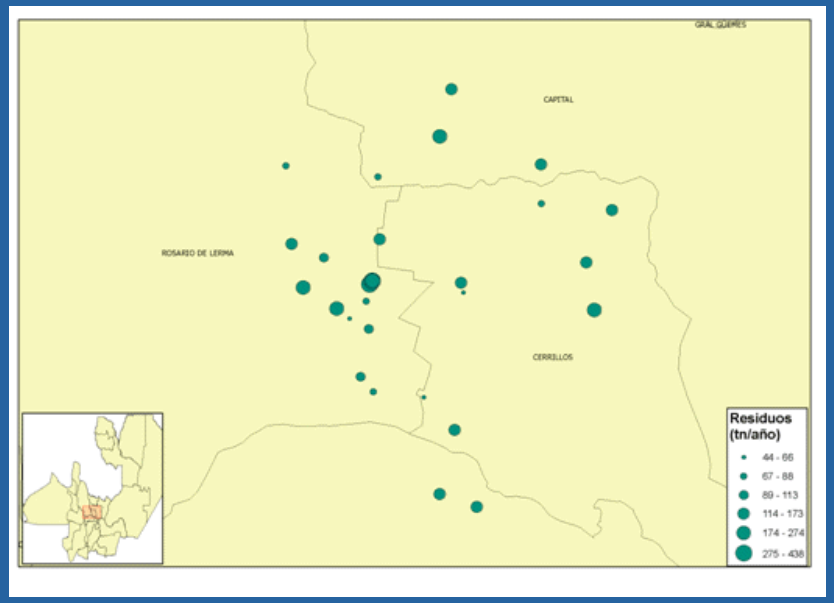


BIOGAS POTENTIAL IN SALTA

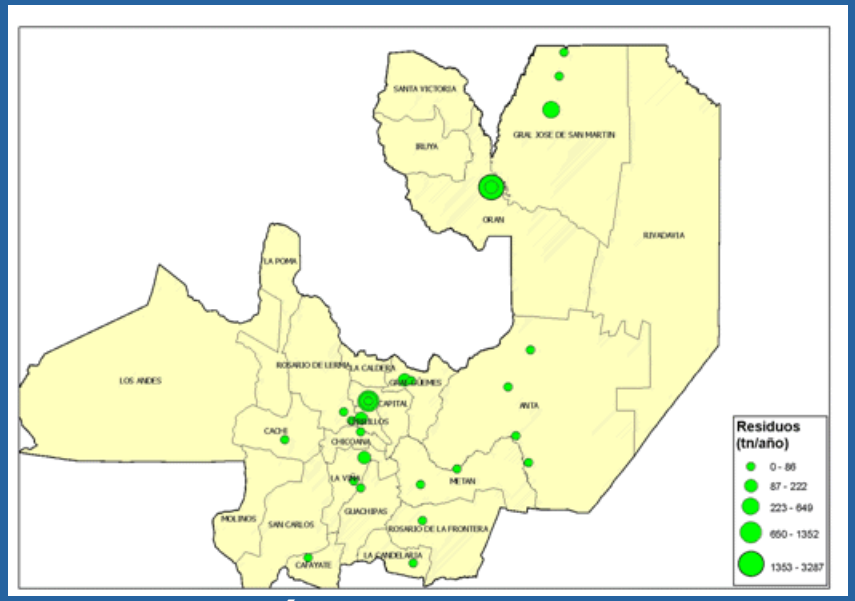
Animal residue potential



Feedlots (24 kg/cabeza/día)



Dairy (3 Kg animal/día)



Faena (18,54% del peso x animal)

Data base

Feedlot ,Dairies, etc

-Type & number of animals

-Mean weight

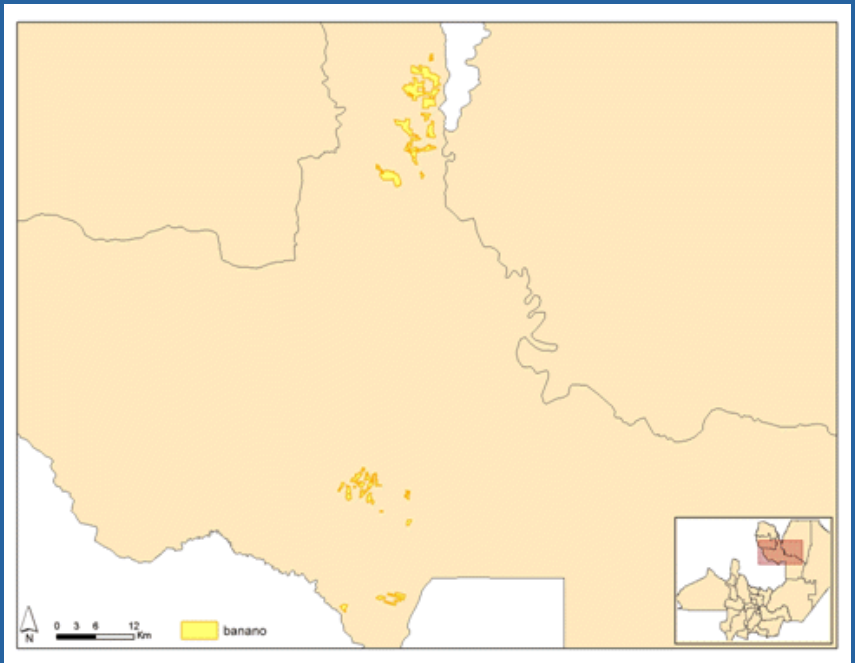
-% de bosteo por peso

--Tiempo de confinamiento

-Slaughterhouses

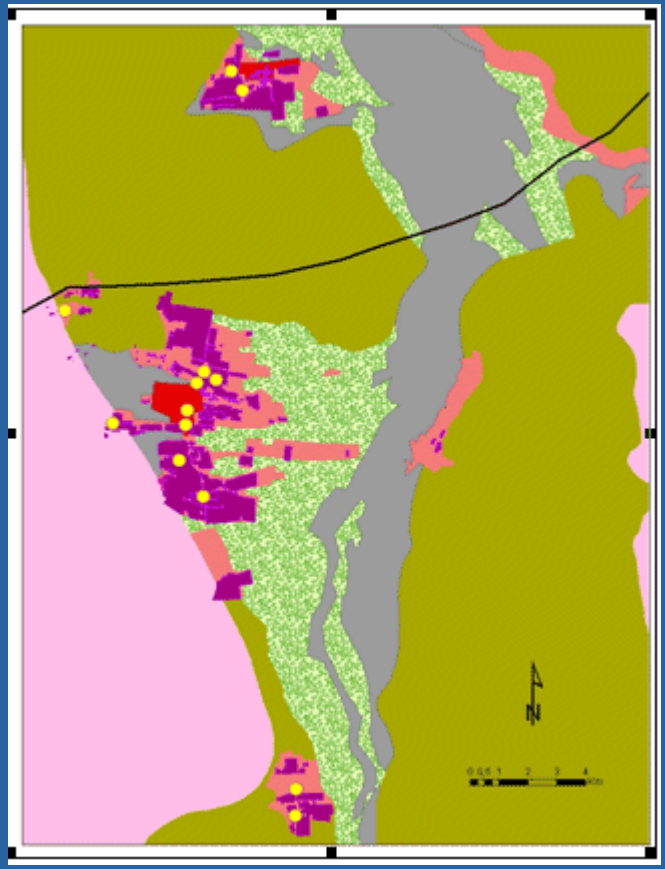
-Process volume

Agroindustrial residues with high humidity



Banano residues

(residuo promedio de 38217Tn base húmeda)

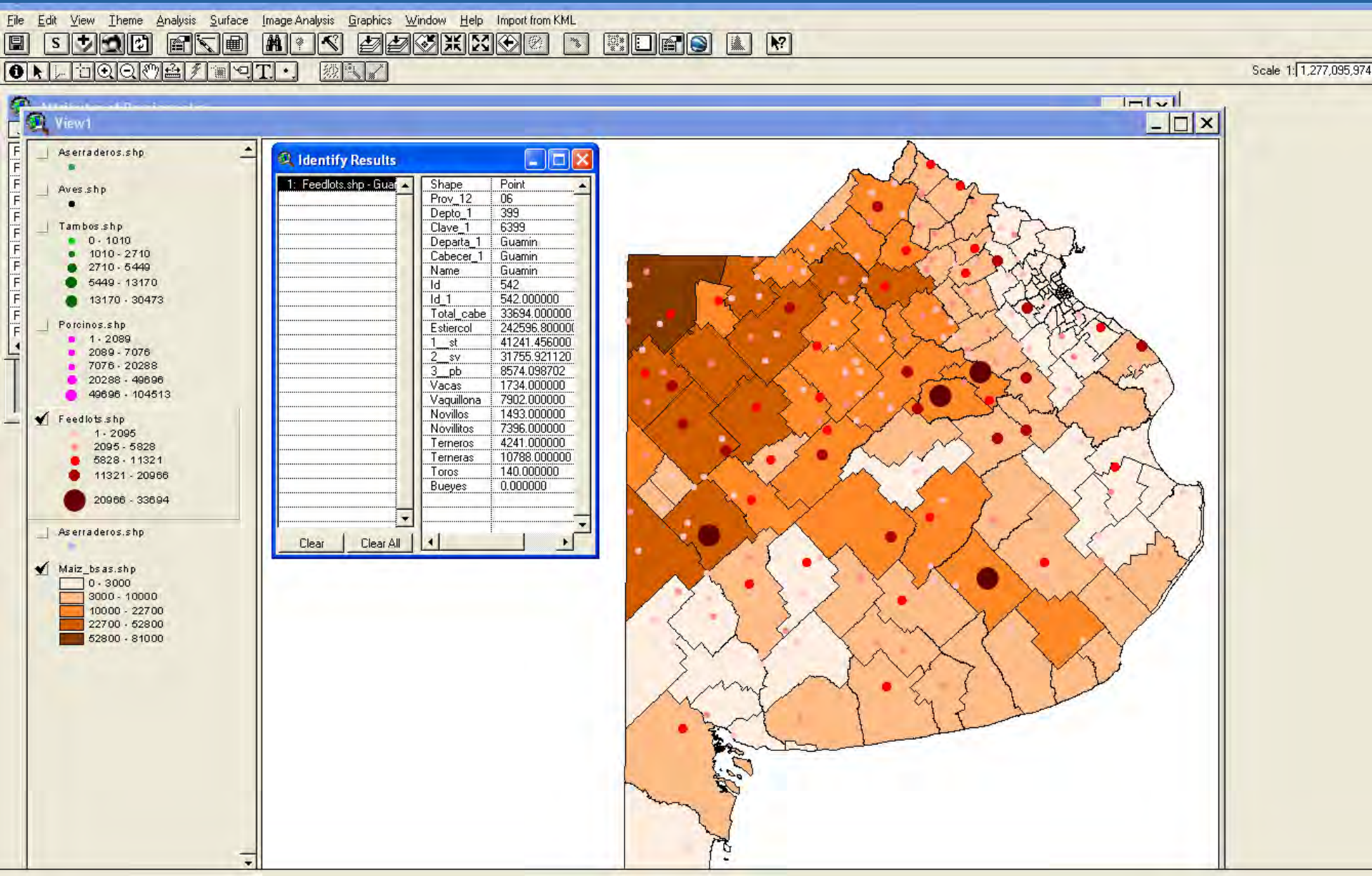


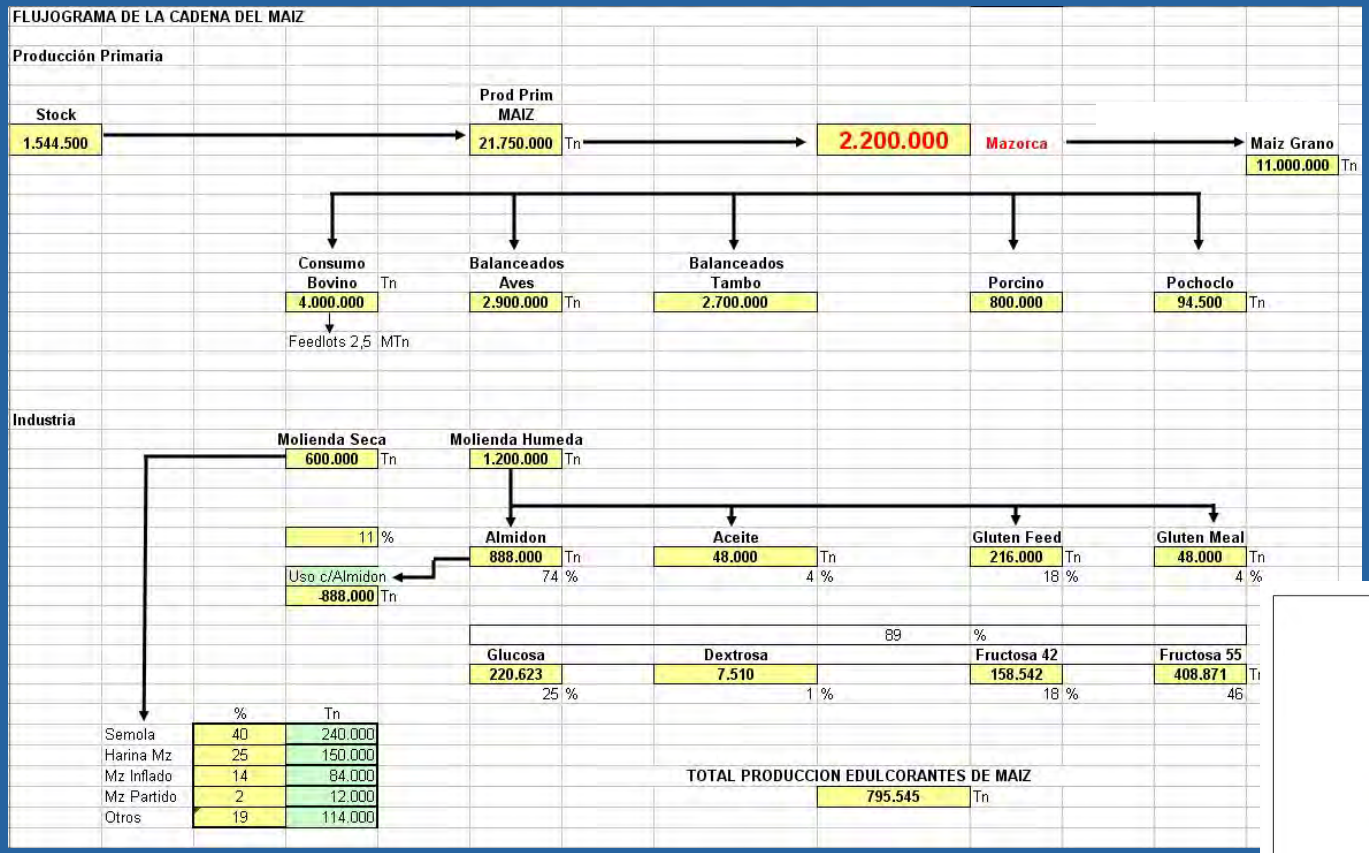
Grapes

	Superficie de viñedos Ha	Residuos orujo de vino Tm	Disponibles para energía Tm(45%humedad)
San Carlos	364,32	1019	764
Cafayate	1490,32	4172	3129

Departamento	Feedlots (anuales)	Feedlots (invernada)	Faena Bovinos	Tambos	Banano	Vid	Total
ANTA	512.917	344.925	128				857.970
CACHI			19				19
CAFAYATE						3.124	3.124
CAPITAL			2.001	635			2.636
CERRILLOS			200	1.214			1.414
CHICOANA				306			306
GRAL GÜEMES			170				170
GRAL JOSE DE SAN MARTIN	159.871		491				160.362
GUACHIPAS							0
IRUYA							0
LA CALDERA							0
LA CANDELARIA			13				13
LA POMA							0
LA VIÑA			147				147
LOS ANDES							0
METAN			135				135
MOLINOS							0
ORAN	119.903		3.509		38.217		161.629
RIVADAVIA							0
ROSARIO DE LA FRONTERA			25				25
ROSARIO DE LERMA							0
SAN CARLOS				2.338		768	3.106
SANTA VICTORIA							0

Residues in Bs.As. province





Need to comine residues for a more efficient energy prodution

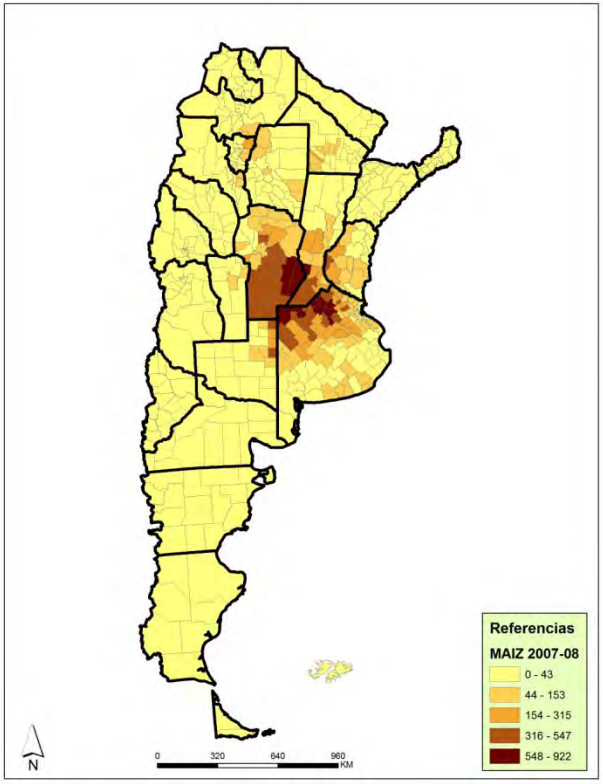
Cobs not used in animal feed plus silos

(18% over 13MTn= 2.188.000 Tn)

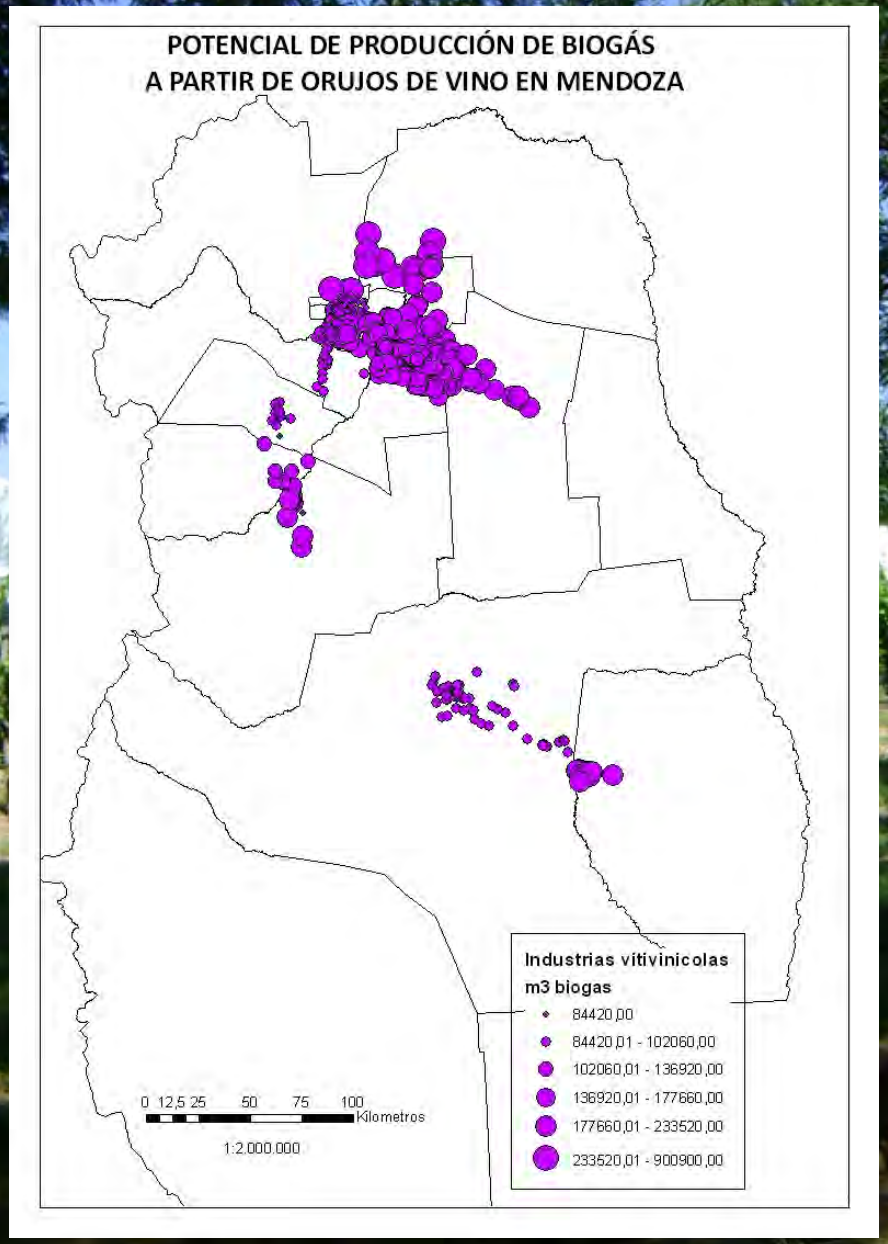
CORN

Restricctions in residue cover

- **Study of local organic material in soils.**
- **Soil erosion risk acording to soil and climate**



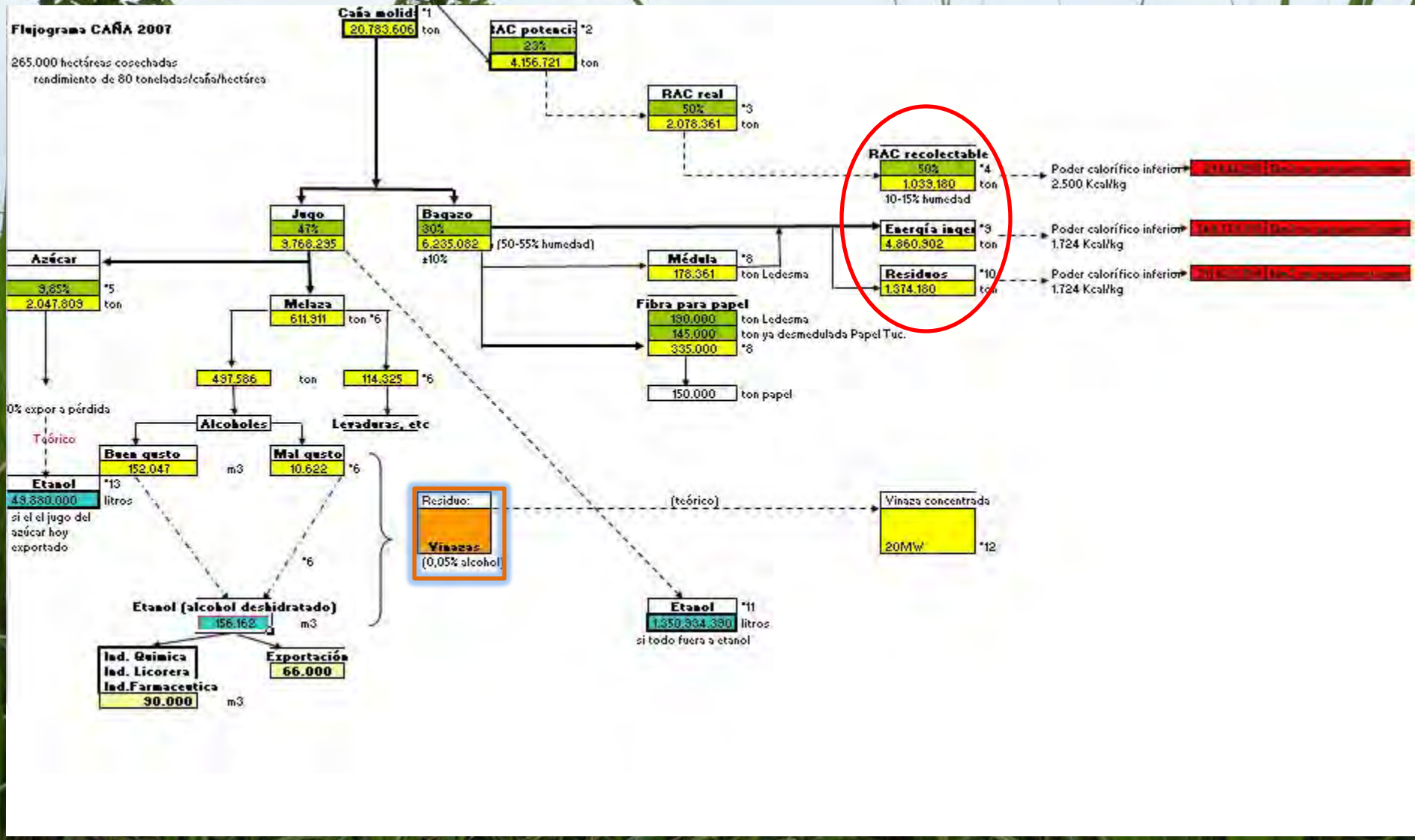
WHINE PRODUCTION IN MENDOZA



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					

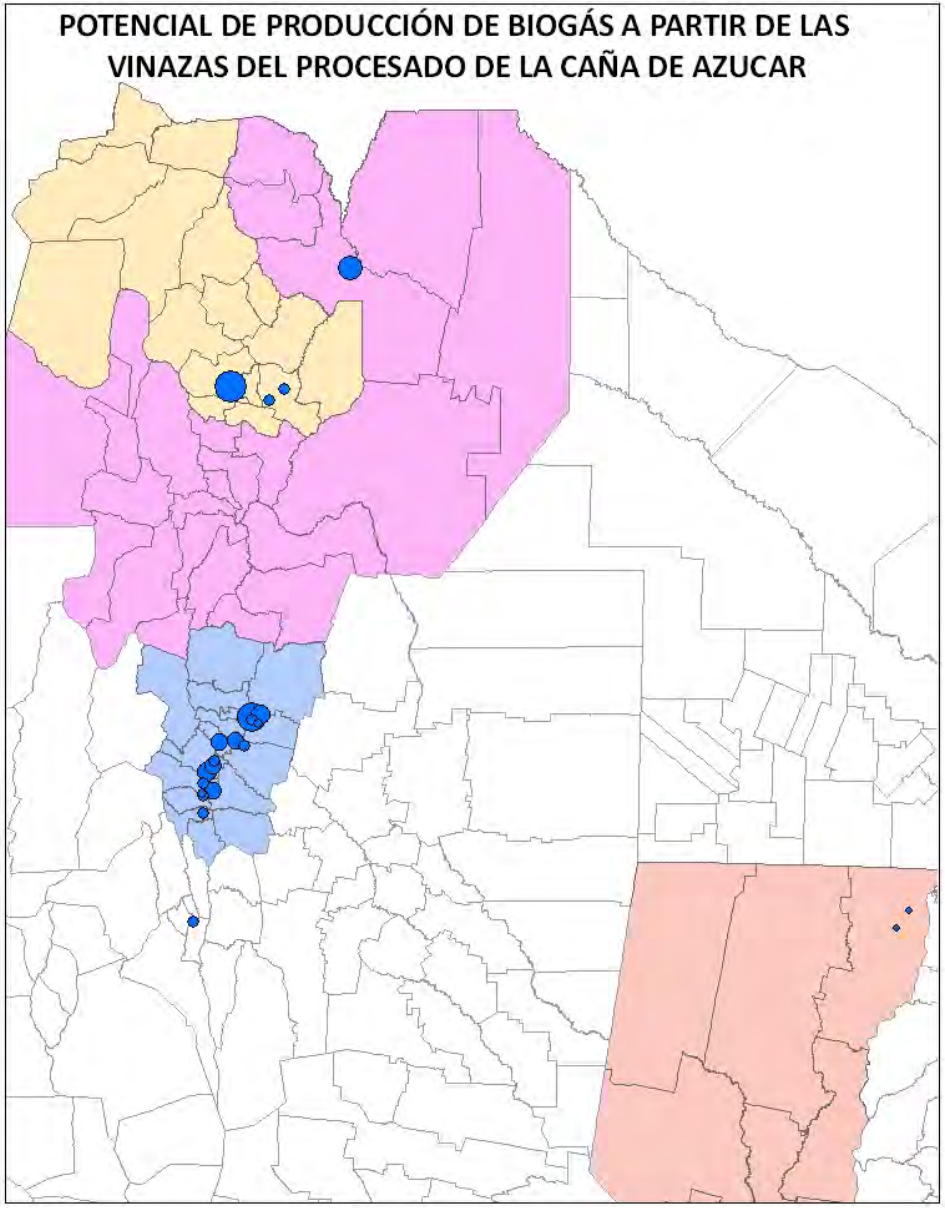
SUGAR CANE


Flujograma CAÑA 2007
265.000 hectáreas cosechadas
rendimiento de 80 toneladas/caña/hectáreas
Caña molid *1
20.783.606 ton
RAC potenci *2
20%
4.156.721 ton
RAC real
50% *3
2.078.361 ton
RAC recolectable
50% *4
1.039.180 ton
10-15% humedad
Poder calorífico inferior
2.500 Kcal/kg
Jugo
47%
9.768.295
Bagazo
30%
6.235.082 (50-55% humedad)
±10%
Energía inge *9
4.860.902 ton
Poder calorífico inferior
1.724 Kcal/kg
Residuos *10
1.374.180 ton
Poder calorífico inferior
1.724 Kcal/kg
Médula *8
178.361 ton Ledesma
Azúcar
9,65% *5
2.047.809 ton
Melaza
611.311 ton *6
Fibra para papel
190.000 ton Ledesma
145.000 ton ya desmedulada Papel Tuc.
335.000 *8
150.000 ton papel
497.586 ton
114.325 *6
0% expor a pérdida
Teórico
Alcoholes
Levaduras, etc
Buen gusto
152.047 m3
Mal gusto
10.622 *6
Etanol *13
49.880.000 litros
si el el jugo del azúcar hoy exportado
Residuo:
Vinazas
(0,05% alcohol)
(teórico)
Vinaza concentrada
20MW *12
*6
Etanol (alcohol deshidratado)
156.162 m3
Etanol *11
1.350.334.380 litros
si todo fuera a etanol
Ind. Quimica
Ind. Licorera
Ind.Farmaceutica
90.000 m3
Exportación
66.000

Residuo:

Vinazas

(0,05% alco



m3 biogas max
103.918.035

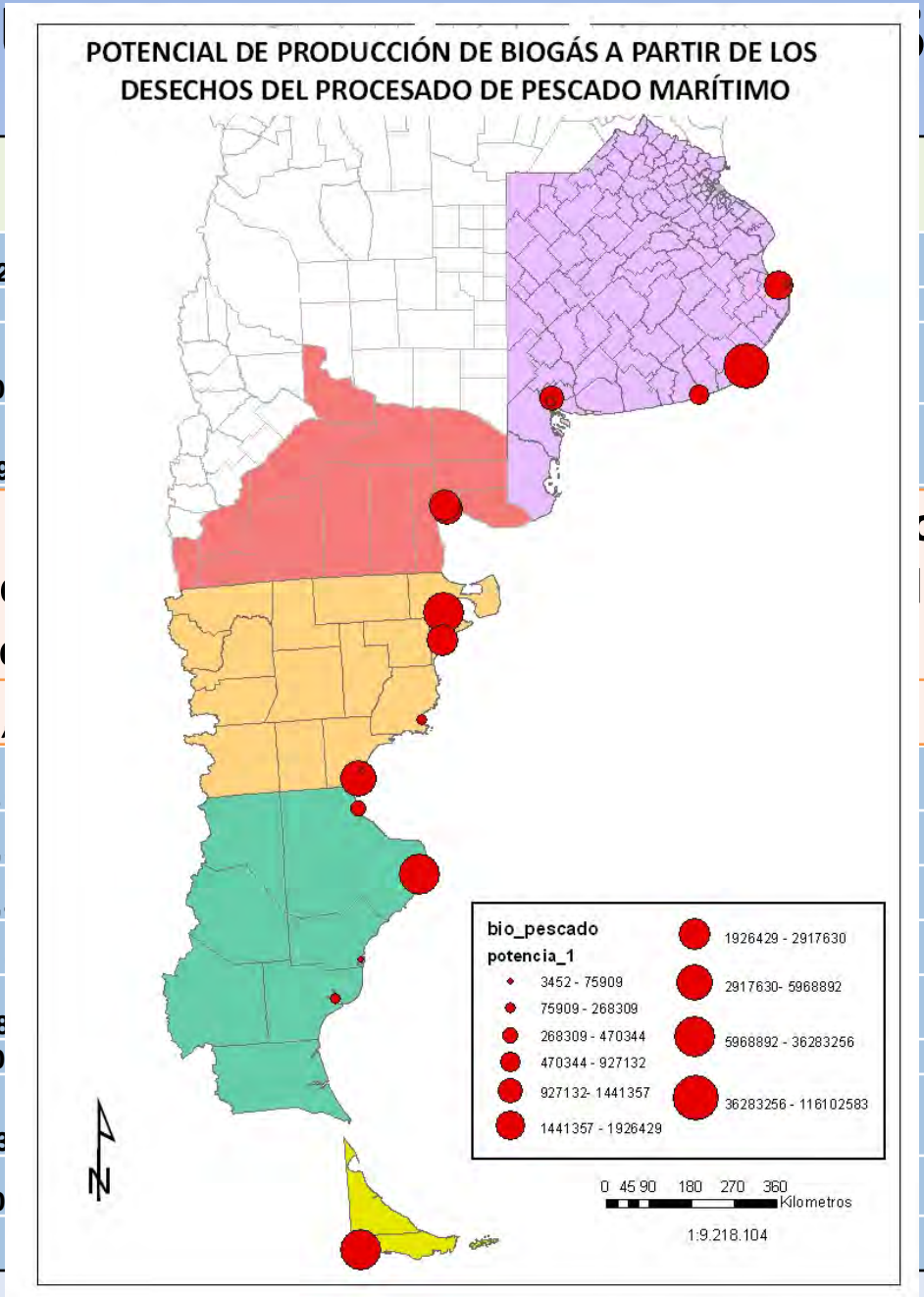
m3 biogas md (16,5 m3/Tn)
68.585.903,10

m3 biogas min
33.253.771,20

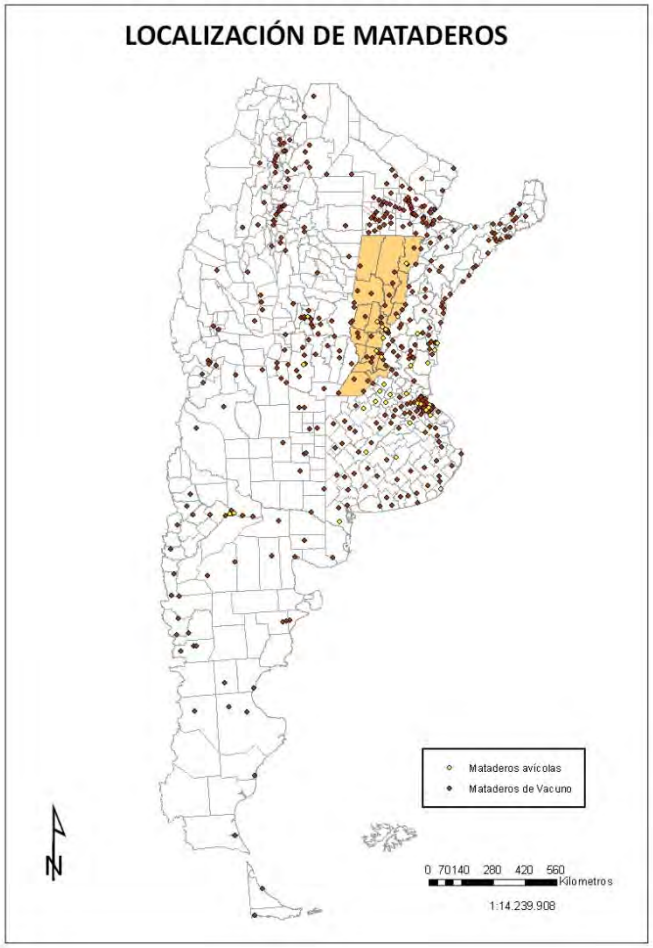
FISH IND TRY

Puerto	Total	potencial de biogás a 0,71 max kg
USHUAIA	93.927,2	22.837.832,33
SAN JULIAN	14,20	3.452,64
SAN CLEMENTE DEL TUY	169,80	41.285,85
SAN ANTONIO OESTE	10.804,9	2.627.146,28
NECOCHEA / QUEQUEN	3.813,1	927.132,27
MAR DEL PLATA	477.505,	116.102.583,12
MADRYN	149.225,	36.283.256,23
GRAL.LAVALLE	7.923,0	1.926.429,68
COMODORO RIVADAVIA	24.548,8	5.968.892,70
CAMARONES	608,40	147.928,79
CALETA OLIVIA / PAULA	19.344,3	4.703.449,91
CALETA CORDOVA	312,20	75.909,55
BAHIA BLANCA	5.928,0	1.441.357,46

Captura en el 2008	55% de desecho	otal de residuos isponibles para biogás
929.647,8	511.306,	318.292,9567

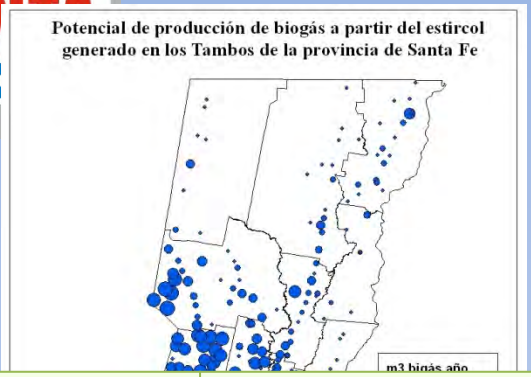


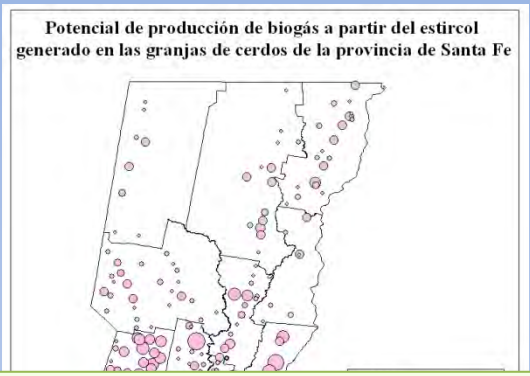
SLAUGHTER HOUSES



Cantidades promedio de desechos comestibles de matadero obtenidos en los centros de matanza										
	Vacuno macho adulto		Vacuno hembra		Vacuno macho joven	Porcino			Pollo	
Peso vivo promedio en Kg.	% peso en vivo	Kg	% peso en vivo	Kg	% peso en vivo	Kg	% peso en vivo	Kg	% peso en vivo	Kg
Peso antes de faenado	100	430	100	320	100	50	100	99,8	100	1,50
Huesos	22,60	5,26	20,30	6,34	24,00	12	32,00	32	0	0
Cuernos	4,80	1,12	5,62	1,76	0,00	0	0	0	0	0
Cabeza sin cuernos	0	0	0	0	6,22	3,11	5,50	5,4	0	0
Patas con cascos	2,10	0,49	1,93	0,60	5,00	2,50	1,10	0,99	0	0
Contenido ruminal y líquidos corporales	5,81	1,35	6,30	1,97	0	0	0	0	0	0
Plumas, sangre y vísceras	0	0	0	0	0	0	0	0	10	0,15

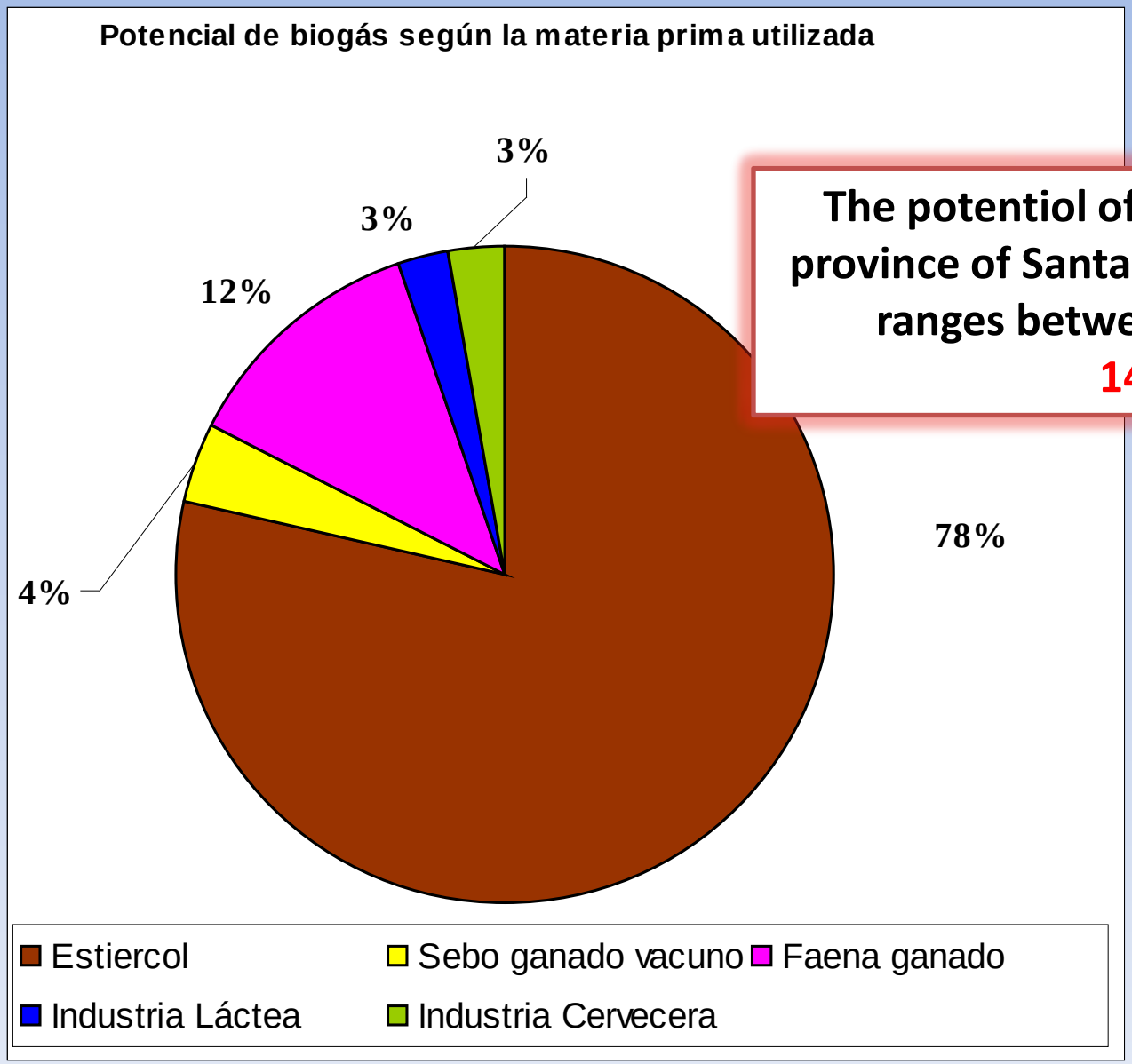
SANTA FE
BIOGAS FROM MANURE





	m3 de biogás/ año									
	Feed Lots		Porcino		Avícola		Vacas de tambo		Totales	
Departamento	Mínimo	Máximo	Mínimo	Máximo	Mínimo	Máximo	Mínimo	Máximo	Mínimo	Máximo
9 DE JULIO	84.414	146.806	26.019,10	38.378,16	1.430,62	2.553,10	35.787,89	62.239,80	147.652	249.977
VERA	1.804.086	3.137.544	122.795,64	181.123,56	88.357,80	157.685,00	53.895,91	93.732,00	2.069.135	3.570.085
GRAL OBLIGADO	4.388.091	7.631.436	219.920,25	324.382,35	170.714,00	304.659,00	73.086,87	127.107,60	4.851.812	8.387.585
SAN JAVIER	258.123	448.908	45.533,16	67.161,43	84.877,90	151.474,00	16.924,33	29.433,60	405.458	696.977
SAN CRISTOBAL	1.676.655	2.915.919	90.569,79	133.590,43	1.506,78	2.689,01	1.429.752,46	2.486.526,00	3.198.484	5.538.724
SAN JUSTO	2.836.350	4.932.796	513.627,12	757.600,01	10.989,90	19.612,70	148.700,64	258.609,80	3.509.668	5.968.619
LAS COLONIAS	2.691.615	4.681.075	1.340.475,23	1.977.200,92	29.997,70	53.534,30	1.283.796,99	2.232.690,40	5.345.885	8.944.501
GARAY	0	0	1.598.977,24	2.358.491,45	46,26	82,56	0,00	0,00	1.599.024	2.358.574
CASTELLANOS	454.944	791.196	2.473.047,01	3.647.744,32	111.432,00	198.863,00	2.302.244,80	4.003.904,00	5.341.668	8.641.707
LA CAPITAL	2.153.292	3.744.860	205.967,15	303.801,56	427.893,00	763.624,00	333.457,80	579.926,60	3.120.610	5.392.212
SAN MARTIN	2.033.064	3.529.944	772.029,76	1.138.743,88	530,02	945,87	615.219,17	1.069.946,40	3.420.843	5.739.580
SAN JERONIMO	4.567.269	7.943.061	578.674,51	853.544,90	84.308,90	150.459,00	254.116,64	441.942,00	5.484.369	9.389.007
BELGRANO	253.242	440.418	1.296.829,23	1.912.823,12	751,85	1.341,76	68.175,80	118.566,60	1.618.999	2.473.149
IRIONDO	2.482.740	4.317.840	798.893,02	1.178.367,21	34.482,90	61.538,60	408.542,68	710.509,00	3.724.659	6.268.255
SAN LORENZO	914.823	1.590.988	277.221,73	408.902,05	93.983,80	167.725,00	77.972,77	135.604,80	1.364.001	2.303.220
ROSARIO	3.175.596	5.522.760	2.899.679,86	4.277.027,79	237.204,00	423.317,00	14.506,56	25.228,80	6.326.986	10.248.334
CASEROS	3.513.798	6.110.922	1.779.322,88	2.624.501,22	1.117,20	1.993,78	137.686,40	239.454,60	5.431.924	8.976.872
CONSTITUCION	553.137	961.966	2.565.653,18	3.784.338,45	32.719,60	58.391,90	11.005,85	19.140,60	3.162.516	4.823.837
GRAL LOPEZ	10.063.485	17.501.724	3.166.026,94	4.669.889,73	35.193,40	62.806,70	348.132,22	605.447,40	13.612.838	22.839.868
Total	**43.904.724**	**76.350.163**	20.771.263	30.637.613	1.447.538	2.583.296	7.613.006	13.240.010	**73.736.530**	**122.811.082**

SANTA FE



The potentiol of biogás production of the province of Santa Fe from available biomass ranges betwen 93.697.210m3 d and 149.619.739.

Dairy farm potential of the principal producing provinces of Argentina

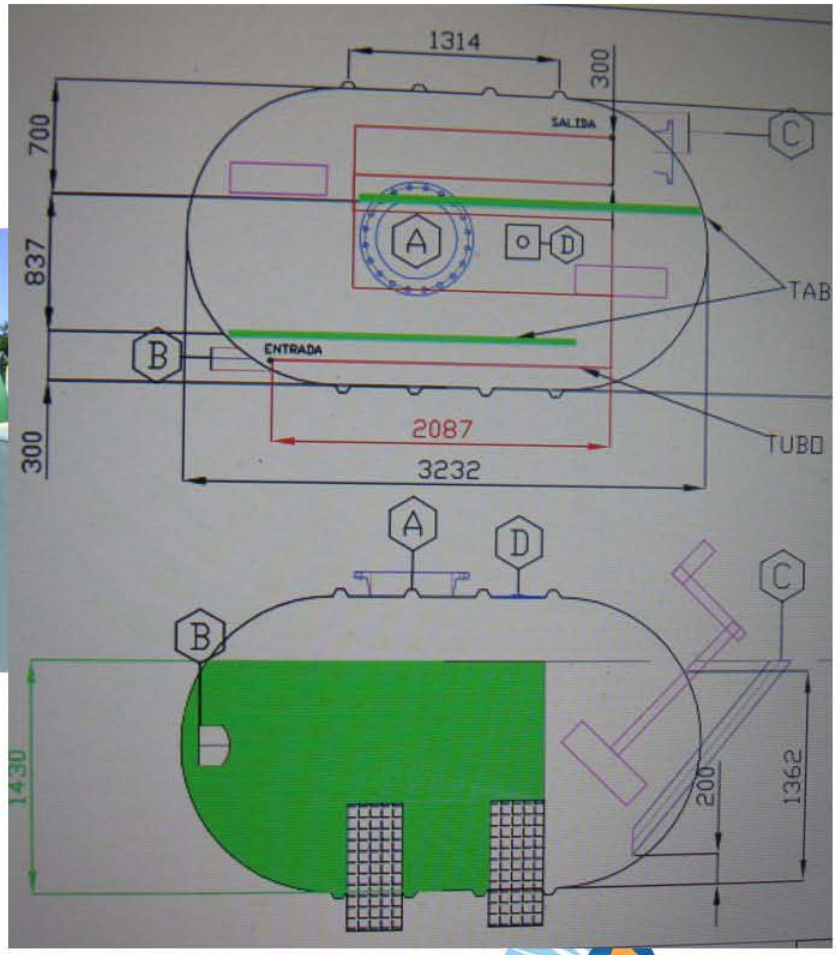
Provincia	Cuenca	Establecimientos	Cantidad de vacas	Producción de leche (% s/ total provincial)	Productividad (kg GB/ha/año)	Kg SV/vaca/día (6)	m3 Ch4/Kg SV (6)		Metano producido por lavado de instalaciones en tambo (kg CH4/d)	
Santa Fe (1*)	Santa Fe Centro	5.194	488.125	90%	130	2,90	0,13	1,00	12.090	
	Santa Fe Sur	362	46.285	10%	157	2,90	0,13	1,00	1.146	
	Resto Provincia	108	6.035	1%	65	2,90	0,13	1,00	149	
	Total Provincia	5.664	540.445	100%	133	2,90	0,13	1,00	13.386	33.958
Córdoba (2*)	VILLA MARIA	2.981	262.500	33%	90	2,90	0,13	1,00	6.502	
	Central	1.097	112.500	16%	s/d	2,90	0,13	1,00	2.787	
	Noreste	2.487	255.000	34%	s/d	2,90	0,13	1,00	6.316	
	Sur	750	120.000	17%	s/d	2,90	0,13	1,00	2.972	
	Resto Provincia	-	-	-	-	2,90	0,13	1,00		
	Total Provincia	7.315	750.000	100%	-	2,90	0,13	1,00	18.577	47.125
Buenos Aires (3*)	Abasto Sur	2.398	133.500	s/d	90	2,90	0,13	1,00	3.307	
	Abasto Norte	832	81.025	s/d	100	2,90	0,13	1,00	2.007	
	Oeste	2.413	316.500	s/d	90	2,90	0,13	1,00	7.839	
	Mar y Sierras	358	66.699	s/d	110	2,90	0,13	1,00	1.652	
	Total									

Case study projects

Research digester I
Food waste

Global Methane Initiative

High efficient dairy farm digester II



Global Methane Initiative

Pilot plant INTA Rafaela Experimental Station Dairy Santa Fe

- **Digester development:**

Dairy farm loaded, problems with crust and lack of mixing device.

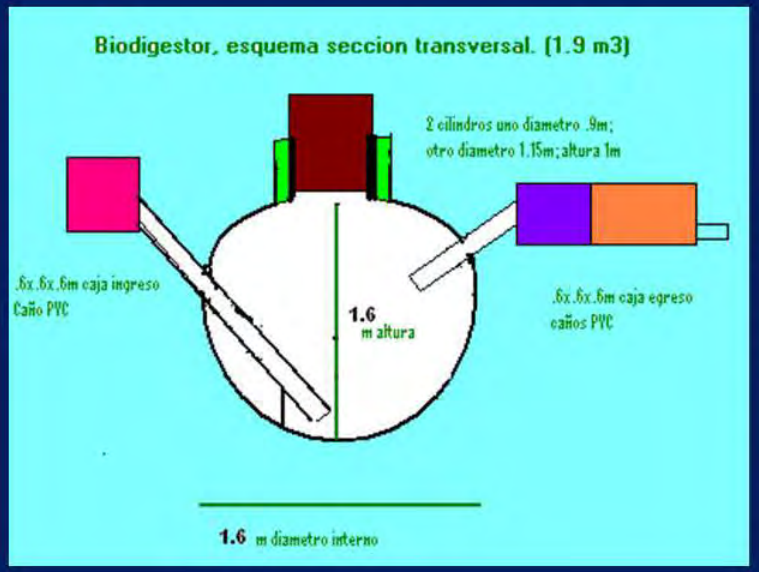
day 10

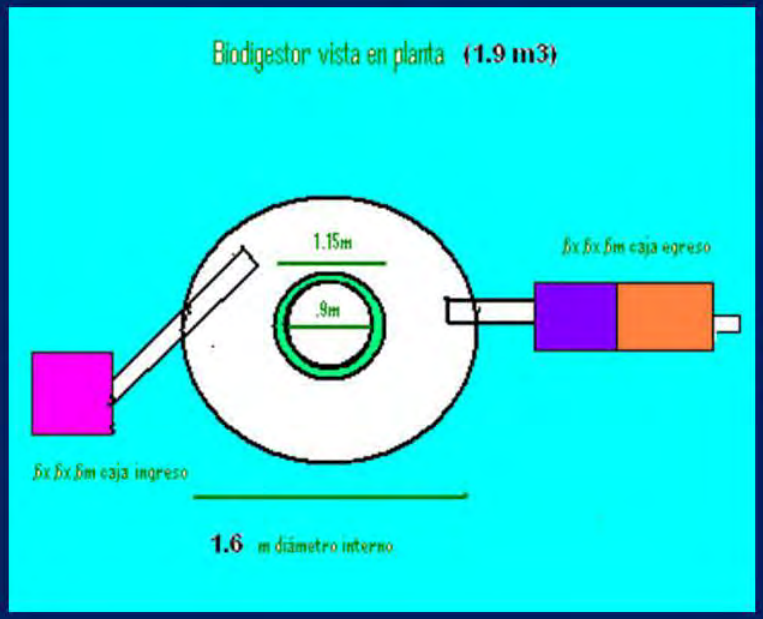
OUT OF SERVICE DUE TO MIXING PROBLEMS AND BAG FAILURE

day 30

Pilot plant Exp station Marcos Juarez Pigs

LOCAL MODELS EXP STATION RECONQUISTA





INTA

FERROCEMENT & FILTERS

University of Mendoza CIM & INTA
new demostrative plant of biogas for agroindustrial residues
2001

Low cost alternatives Exp Station LAS BREÑAS Chaco

OUT OF SERVICE DUE TO MIXING PROBLEMS AND BAG FAILURE

INTA

TECHNOLOGICAL OFFERS

ARGENTINA COMPANIES IN BIOGAS

2. 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 Biodigestrs 3619 m3 c/u
- ✓ Two secundary 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.

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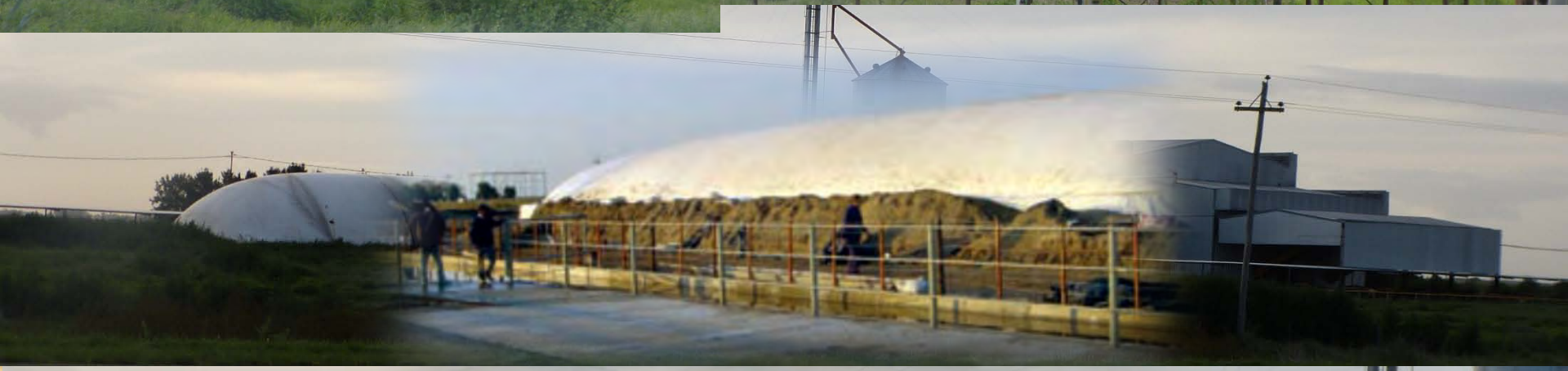
Río Cuarto - Córdoba

BIOELECTRICA FINISHING FIRST DIGESTERS
WITH PLANS TO CONSTRUCT 60 PLANT OF 1 Mw

Investors 29 farmers



FIRST FEEDLOT IN THE PROVINCE OF BUENOS AIRES

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

PFI
ENERGY & ECOLOGY

BIO METANOS DEL SUR S.A.

Proyectos de Producción Agropecuaria y Desarrollo Sustentable

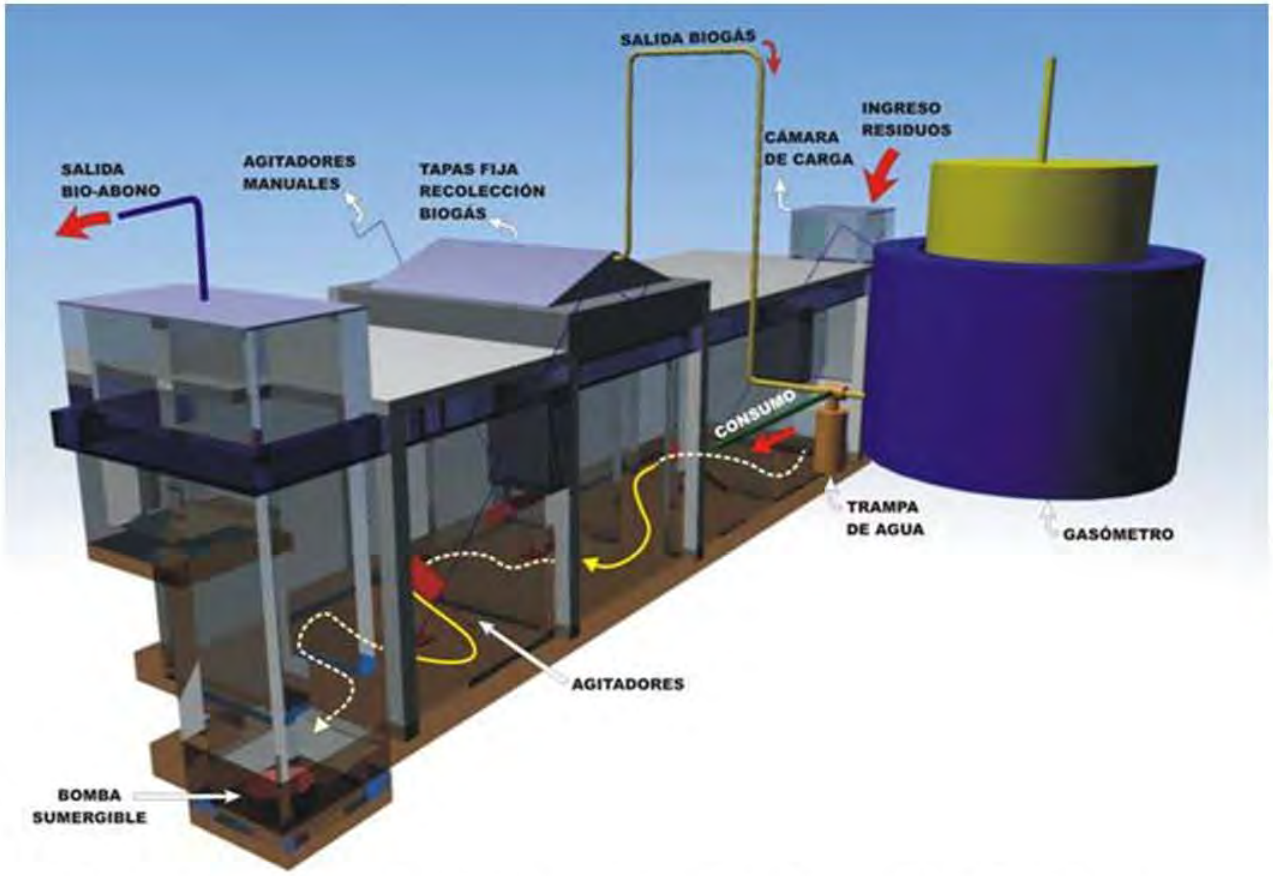
250 m3
volumen

250 m3
volumen

1750 m3
volumen

eg-ingeniería
www.eg-ingenieria.com.ar
Tecnología Sustentable
Tratamiento de Efluentes - Gestión de Residuos Sólidos
Energías Renovables
Biodigestores
Eco-Metano

Planta de Biodigestión Planteada



Biodigestor de desplazamiento horizontal- flujo pistón

Componentes:

- Cámara de carga
- 8 cámaras de 10m^3
- Tapa fija de recolección de biogás
- Agitadores manuales
- Cámara de descarga

Methane to Markets

INTA

Biogas production from agroindustry residues

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

New Anaeróbic digester CALSA
ADI BVF Tucuman 2010/11

420000 CO2 reduction/year

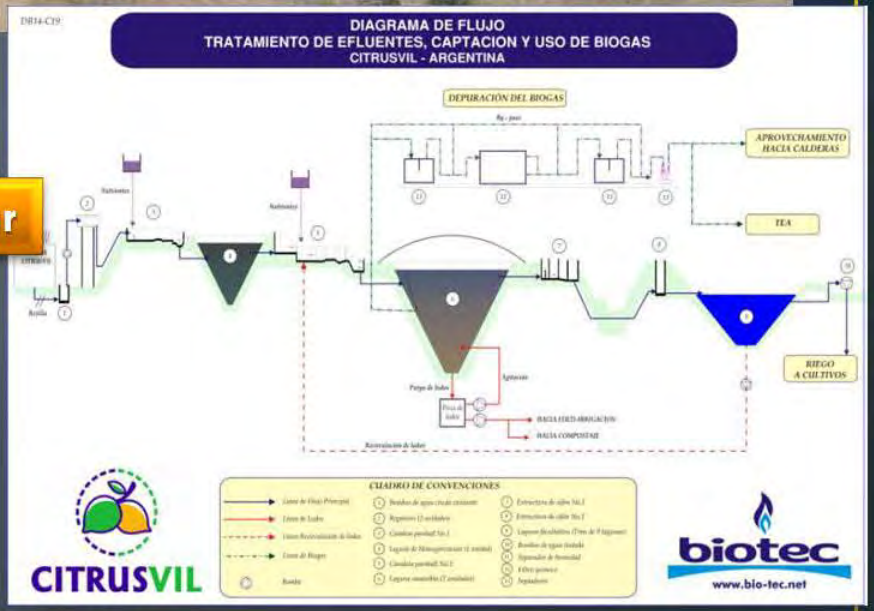
High efficiency UASB plant corn plant Chaabuco and Baradero Dedini Technology Brazil

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

Parshalls de ingreso a biodigestores

51.0000 CO2 reduction/year



CITRUSVIL: 80.000 m3 - 2700 m3/hour

Las Camelias Chicken slaughter house Entre Rios 2011

1500 cub meter of biogas per day

8700 Tons/year reduction CDM

http://inta.gob.ar/bioenergia

INTA

Instituto Nacional de Tecnología Agropecuaria

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Temas destacados | Publicaciones | Proyectos | Unidades | Sobre el INTA | Contacto

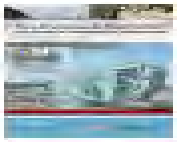
Bioenergía

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 (rastrojos) 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

NOV 7 2013 — Rol del bioetanol en la matriz energética

NOV 11 2013 — 1ª Jornada Internacional de Biomasa

NOV 13 2013 — III Congreso Internacional de Ambiente y Energías Renovables

Ver todos

NoBolas sobre Bioenergía

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

Ver todas

INTA EXPONE Patagonia

>> Continuar viendo todo lo que pasó 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 @ArgentinaPTrópicos 2 nov

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

Abrir

Bioenergía INTA @ArgentinaPTrópicos 2 nov

4 Jornada biocombustibles

Pan American Biofuels and Bioenergy Sustainability Research Coordination Network (RCN)

WORLD CONFERENCE RECIFE PERNAMBUCO 23 AL 25 JULY 2014

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

Research Coordination Network

Workshops / Conference

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

Obrigado ¡¡¡
Thank you for your attention

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  - http://inta.gob.ar/bioenergia

Ministerio de Agricultura, Ganadería y Pesca
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