INTA National Bioenergy Program NBP

Definition:

We understand bioenergy as the one derived from using and transforming biomass into different energy vectors (solid liquid and gas) in order to be employed for energy requirements. INTA has been active in the area for the last 20 years. Work is focused in the principal productive chains related with solid, gas and liquid energy vectors in accordance with sustainable development principles

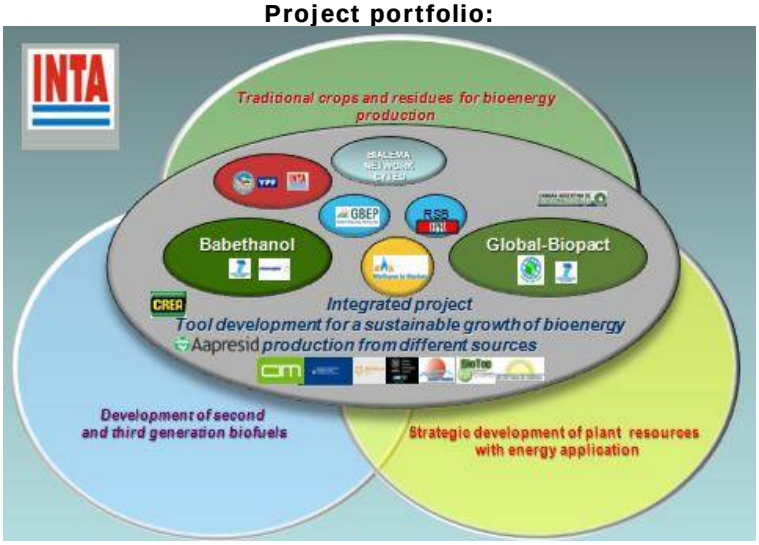
Aim:

Secure the supply of sustainable bioenergy sources and services, taking care and supporting sustainable development, national energy security, poverty reduction, climate change attenuation & environmental equilibrium in all the national territory

Organización

The program Works through national projects and coordinates actions within INTA and with external actors at a national and international level.

Project portfolio:



Integrated project

Tool development for a sustainable growth of bioenergy production from different sources.

- ✓ General objetive:
- ✓ Consolidate knowledge and technology in order to contribute with sustainable bioenergy production According to the national public policies.
- ✓ Specific objetives:
- ✓ Characterize y quantify the energy potential of different crops adjusting the agronomical techniques to the different ecoregions and the final use of co products and residues from the agricultural and agro industrial sector.
- ✓ Study and development of no traditional crops with bioenergy potential.
- ✓ Development of second generation biofuels.

Coordinator Jorge A. Hilbert hilbert@cnia.inta.gov.ar

Specific project portfolio

Specífic project
Residues and traditional crops for bioenergy production

- ✓ Energy balance, life cycle analysis LCA. Reference laboratory for fuels homologation and efficiency studies.
- ✓ Development of a Geographic Information System at a national level considering crops and residues for bioenery purposes.
- ✓ Development of particular crop study networks :
  - › Rape seed EEA Barrow
  - › Carthamus EEA Ascasubi
  - › Corn EEA Pergamino
  - › Topinambur EEA Manfredi
  - › Sugar beet EEA San Juan
  - › Panicum Virgatum EEA Anguil
  - › Sorghum EEA Manfredi
  - › Sugar cane EEA Famaillá

Coordinator: Lidia B. Donato Rural Engineering Institute ingdonato@correo.inta.gov.ar

Specific project
Strategic plants resources with energy application

- ✓ The project initially is focused on technology development of Jatropha:
- ✓ Development of field agronomical management *Jatropha.*
- ✓ Molecular genetic improvement *J. curcas* L.
- ✓ Ecofisiology *J. curcas* L.
- ✓ Micro propagations development.
- ✓ Oil quality and biodiesel analysis.

Coordinator Claudio Pastrana Salta Experimental Station cppastrana@correo.inta.gov.ar

Specífic project

Generation & development of second and third generation biofuels

- ✓ The project is focused on the improvement of ethanol production from cellulosic materials:
- ✓ Bacteria biodiversity studies using met genomic tools looking for cellulose degradations. (Ex rumen environment).
- ✓ Evaluation of identified genes within different protein recombinant expression (bacteria's, yeast *Piccia pastoris*,). Enzymes that can degrade cellulose and sugars table to be assimilate by alcohol yeast and bacteria are going to be pursued.
- ✓ *Escherichia coli* improvement for optimizing ethanol production and other useful products coming from sugars.

Coordinator Daniel Grasso Soil Institute CIRN dgrasso@cnia.inta.gov.ar

National and international activities, projects, partnerships and networks were the National Bioenergy Program **NBP** of INTA is actively involved.

The NBP has a specific agreement with CIM GTZ for the development of biogas in Argentina. German experts are participating in implementing demonstrative and practical digesters in the agricultural and agroindustrial areas of different parts of the country. The action plan is implemented through an agreement with the National Institute of Industrial Technology INTI.

PROYECTS

New feedstock and innovative transformation process for a more sustainable development and production of lignocellulosic ethanol. Grant agreement no.: 227498-2

The BABETHANOL project proposes solutions for a more sustainable approach of 2nd generation renewable Biofuels, based on a "moderate, environmental-friendly and integrated" transformation process that should be applicable to an expanded range of lignocellulosic feedstock. INTA is participating through PROCISUR in a Latin American network of research institutions.The new process, called CES -Combined Extrusion-Saccharification, will be an alternative to the costly processes of the state-of-the-art, notably the current pre-treatments requiring much energy, water, chemical products, detoxification and waste treatment. CES will be developed and tested from laboratory up to semi-industrial pilot-scale with different feedstockA Europe-Latin America lignocellullosic biomass catalogue will also be developed as a further contribution to the identification and expansion of feedstockThe success of the new project much relies on the well-balanced consortium with 7 European partners, 6 Latin American partners, the multidisciplinary expertise with agriculture/agronomy, chemical/catalysis, microbial systems engineering, industrial plant design and the integration of SMEs. http://www.babethanol.com

Global Assessment of Biomass and Bioproduct Impacts on Socio-economics and Sustainability http://www.globalbiopact.eu/ The main aim of the Global-Bio-Pact project is the development and harmonization of global sustainability certification systems for biomass production, conversion systems and trade in order to prevent negative socio-economic impacts. Specific objectives are:

- ✓ Identify socio-economic impacts of feedstock production
- ✓ Identify socio-economic impacts of conversion chains
- ✓ Analyze impacts on food security
- ✓ Investigate links between social and environmental impacts
- ✓ Review current and future trading schemes
- ✓ Analyze public perception
- ✓ Make recommendations for certification

INTA is a member of the advisory board of BioTop project that provides a broad overview of the existing biofuels sector in Latin American counties. Key focus of the project is the identification and assessment of improved 1st and 2nd generation biofuel conversion technologies. Sustainability, standardization and trade aspects of future large-scale biofuel production are investigated, and scenarios, roadmaps and recommendations are developed. Exchanges between stakeholders active in RTD of biofuel conversion technologies are promoted and BioTop activities are effectively linked with existing networks. Outcome of the BioTop project is increased awareness about EU-LA opportunities for collaboration in the area of biofuels and the identification of suitable areas for biofuels RTD cooperation. www.top-biofuel.org

International partnerships

Methane to Markets

INTA through the program is chairing the agricultural commission of the methane to markets partnership. M2M is an international initiative that focuses on advancing cost-effective, near term methane capture and use as a clean energy source. The partnership facilitates collaboration among national governments, the private sector, development banks and other organizations to reduce global emissions of methane a potent greenhouse gas. http://www.methanetomarkets.org/

GBEP Global Bioenergy Partnership

The national program is an active member of GBEP Global Bioenergy Partnership that brings together public private and civil society stakeholders in a joint commitment to promote Bioenergy for sustainable development. INTA has organized world meetings in Argentina and is contributing for the development of criteria and indicators. http://www.globalbioenergy.org/

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE **RSB**

INTA through the Bioenergy program is a member of the Roundtable on Sustainable Biofuels, an international initiative bringing together farmers, companies, non-governmental organizations, experts, governments, and inter-governmental agencies concerned with ensuring the sustainability of Biofuels production and processing. The Roundtable's multi-stakeholder Steering Board has been responsible for overseeing this standards drafting process, according to the ISEAL Alliance Code of Good Practice for Standard Setting.

Latin American network

INTA is a full member of Bialema network funded by CYTED The network Works for creating awareness and expanding knowledge on the different impacts of Biofuels production as energy balance, Food competition, and environment aspects including the reduction of GHG. The network belongs to the international CYTED program and works with leading technological partners of Latin America Spain and Portugal http://www.icidca.cu/red/QueEs.htm

National networks:

CREA Aapresid SECRETARIA DE ENERGIA CAMARA ARGENTINA DE BIOCOMBUSTIBLES CAMARA ARGENTINA DE BIOCOMBUSTIBLES

INTA is the principal technical reference in Biofuels matters for the Ministry of Agriculture, Secretary of Environment and Energy at a national federal level. The program has strong relations with national Biofuels chambers and associations (CARBIO, ABH and CADER), working together on technology and sustainability issues. There are joint initiatives with Universities and leading farmers associations (CREA, AAPRESID) and principal fuel companies as YPF

INTA

More information: http://www.inta.gov.ar/info/bioenergia/bio.htm

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INTA is a public decentralized body subordinated to the Secretariat of Agriculture, Livestock, Fisheries and Food with operative and financial autarchy. Its mission is"To carry out and foster actions addressing the innovation of agricultural and livestock, agro-food and agro-industrial sectors to contribute to the competitiveness of agro-industrial chains, environmental health and sustainability of productive systems, social equity and territorial development, through research, technological development and extension". (2005-2015 Institutional Strategic Plan)