ITAIPU TECHNOLOGY PARK - PTI

Marcelo Alves de Sousa
Institutional Relations Manager

PTI - Itaipu project on microgrid (solar + biogas)

6th Bioenergy Week and Study Tour for Capacity Building

Buenos Aires, 16-18 October 2018
1. Brief overview of PTI

- Foundation belonging to Itaipu Brazil
- Connection of education, research, innovation and businesses
- Promotion of the fifty helix concept (academy, entrepreneurs, government, investors and society)
- Main areas: Renewable energy, water, technology and food production
- Under internationalization process
Western region of Paraná

- 4.2 millions of swine
- 105 millions of chickens;
- 1.3 millions of bovines.

Source: IBGE 2015
4. PTI - Itaipu actions for biogas + solar in the region

**Biogas**
- Itaipu, PTI and CIBiogás implemented 11 demonstration unities to prove biogas feasibility
- Biomethane plant built in the dam premises (sewage, grass and food waste)
- 80 (out of 250) vehicles of the Itaipu fleet fulfilled with biomethane
- 60 (out of 250) vehicles of the Itaipu fleet fulfilled with electricity
- BOKU and TUWien (Austria) gave great technical and scientific support to implement the biogas plant

**Solar**
- About 500 MW potential, generating 2.200 GWh/year of energy in the region
- Needed area: 400 hectares (Farms rooftops / floating on the dam reservoir / under transmission lines)

- Sources: PTI, CIBiogás and study prepared by Spirit Design and BOKU University (Austria)
Combination to ensure safe and sustainable energy supply
Purpose: Understand technical viabilities to implemented microgrid and develop a business model.

Partners: Itaipu, PTI, CIBiogás and COPEL

Period: October 2018 to April 2020

Investment: R$ 3,7 millions
(+/-US$ 900 thousands)
Dimensions of the pilot project

- Innovation
- I.o.T, smart farm, Agro 4.0
- Technological development
- Quality energy
- Renewable energy
- Gas emission reduction
- Competitiveness
- Food security
- Hydro resources and soil protection
- Animal health
- Job offer
5. Conclusions

- Urgent need to enhance regulatory basis for rural microgrids in Brazil
- Microgrids are of great interest of farmers, cooperatives and agribusiness in general
- Support to the Electric Companies to enhance quantity and quality of the energy sent to the rural grid
- Support to avoid energy interruption and animals deaths
- Keep energy reliability and safety in rural areas

- PTI, CIBiogás and Itaipu are implementing microgrids projects (solar + biogas) to consolidate the concept and benefits to the State Electric Company, the National Electric Energy Agency and the State Agriculture Secretariat
PTI PARTNERS
Background:

Founded in 1974 to help countries co-ordinate responses to disruptions in the supply of oil (crises 1973/4).

IEA is focused on energy issues including oil, gas and coal supply and demand, renewable energy technologies, electricity markets, energy efficiency, access to energy and demand management.

Main areas:
• Energy Security
• Economic Development
• Environmental Awareness
• Engagement Worldwide

Members: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, The Netherlands, Turkey, UK and USA.

• Brazil and Argentina are associates. Not members.
IEA Tasks

32 Biomass combustion and co-firing
33 Gasification of biomass and waste
34 Direct thermochemical liquefaction
36 Integrating energy recovery into solid waste management systems
37 Energy from biogas
38 Climate change effects of biomass and bioenergy systems
39 Commercialising conventional and advanced liquid biofuels from biomass
40 Sustainable biomass markets and international bioenergy trade to support biobased economy
42 Biorefining in future bioeconomy
43 Biomass feedstocks for energy markets
54 Price reduction of solar thermal systems
55 Towards the integration of large SHC systems into district heating and cooling (DHC) network
56 Building integrated solar envelope systems for HVAC and lighting
57 Solar standards and certification
58 Material and component development for thermal energy storage
59 Deep renovation of historic buildings towards lowest possible energy demand and CO2 emission
60 Application of PVT collectors and new solutions in HVAC systems
61 Integrated solutions for daylighting and electric lighting

ITP Inter-task projects
SP Special projects
Objective: To address the challenges related to the economic and environmental sustainability of biogas production and utilization.

Scope of the Task
. To carry out expert technical work on sustainable digestion of substrates, associated reactor configurations and utilisation of produced biogas
. To provide expert technical support to assess the externalities of biogas systems
. To provide guidance and advice on best practice to policy makers
. To provide technical support to policy makers and to the public

Website: www.task37.ieabioenergy.com

Task leader: Professor Jerry D Murphy
Email: Jerry.Murphy@ucc.ie
Member countries participating in Task 37-Bioenergy

Australia          Bernadette McCabe
Austria            Bernard Drosg / Günther Bochmann
Brazil             Marcelo Alves de Sousa / Rodrigo Regis
Denmark            Teodorita Al-Seadi
Estonia            Elis Volimer
Finland            Saija Rasi
France             Olivier Théobald / Guillaume Bastide
Germany            Jan Liebertrau
Ireland            Jerry Murphy
Korea              Soon Chul Park
Norway             Tormod Briseid
Sweden             Anton Fagerstrom
Switzerland        Urs Baier
The Netherlands    Mathieu Dumont
United Kingdom     Clare Lukehurst / Charles Banks
Technical Reports Triennium 2016 - 2018

1. Methane emissions from biogas plants
2. Green Gas
3. Integrated Biogas Systems
4. The role of anaerobic digestion and biogas in the circular economy
5. Governance of environmental sustainability
6. Value of batch tests for biogas potential analysis
7. Food waste digestion systems.

Case studies Triennium 2016 - 2018

1. Den Eelder Farm: small farm scale mono-digestion of dairy slurry.
2. Green Gas Hub: provision of biogas by farmers by pipe to a Green Gas Hub with a centralised upgrading process.
3. **Biomethane demonstration: Innovation in urban waste treatment and in biomethane vehicle fuel production in Brazil.**
4. Profitable on- farm biogas in the Australian pork sector.
5. Sondrerjysk Biogas Bevtoft: Hi tech Danish biogas installation a key player in local rural development.
6. Icknield Farm Biogas: an integrated farm enterprise.
Thank you
marcelo@pti.org.br